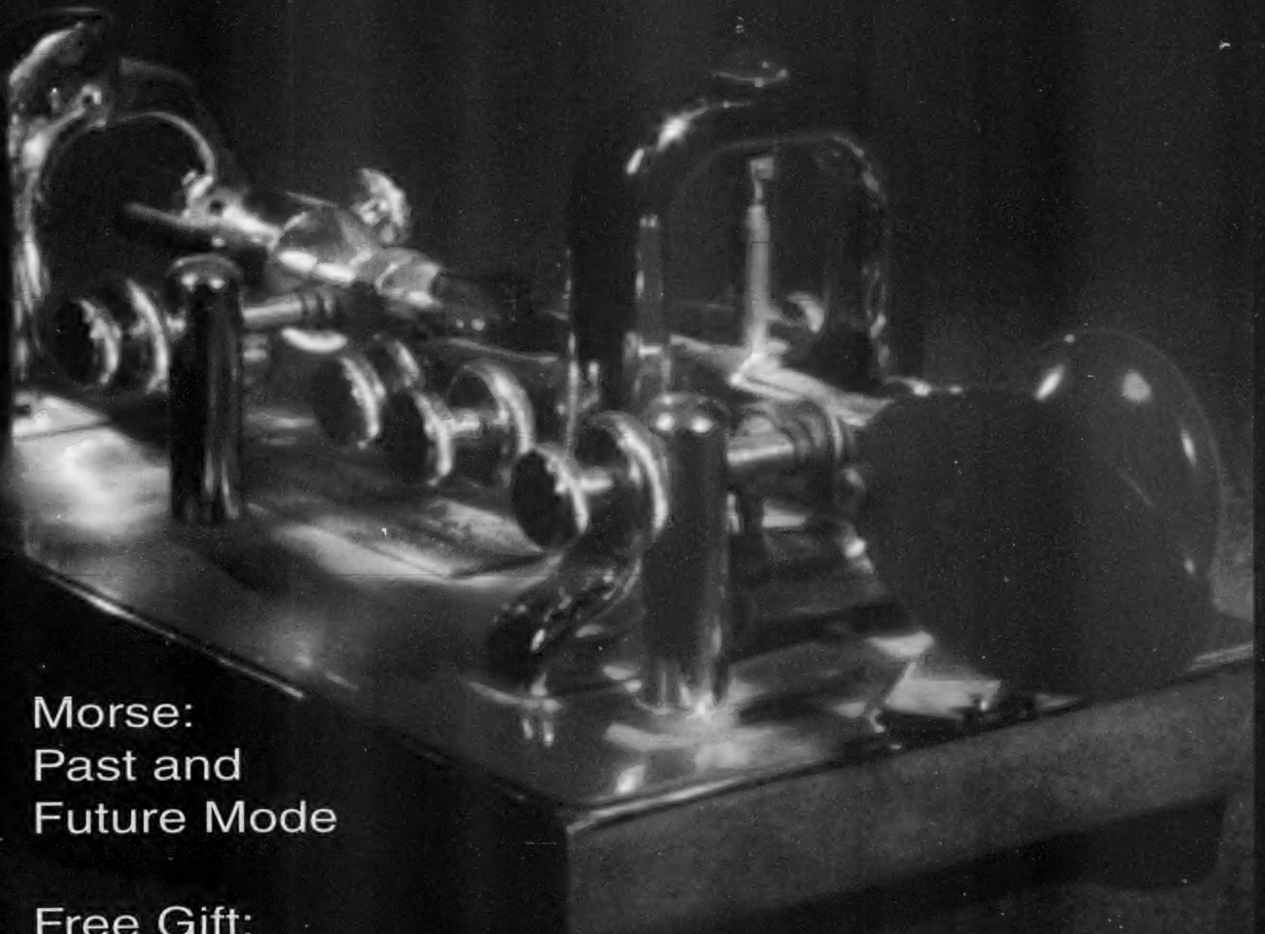
THE NEW!

73® Amateur Radio Today

APRIL 2000
ISSUE #473
USA $3.95
CANADA $4.95

CW Special!



Morse:
Past and
Future Mode

Free Gift:
Color Pull-Out
Band Charts

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Work the World With Alinco!

Base, mobile, portable or marine, Alinco HF transceivers open a world of possibilities at prices that are down to earth. Check out this great equipment and the low Alinco price at your favorite dealer!

DX-70TH HF+6m

Mobile/Base/Portable

Rugged and versatile, DX-70 radios are recognized around the world as proven performers!

160m ~ 6m Amateur Band TX in all modes, general coverage RX 150 KHz ~ 30 MHz and 50 ~ 54 MHz, 2 VFOs, 100 memories, removable face for remote mounting, speech compressor, SSB, CW and AM narrow filters, full, semi or automatic break-in, multi-function control, RIT, TXIT, easy split operation, RF gain, CTCSS for 10 and 6m repeaters. 100w output on both HF and 6m.

DX-77T HF Desktop Transceiver

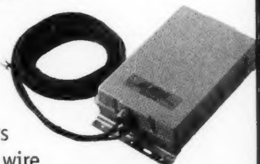
It's the radio Amateurs asked us to build!

A super performer at a tiny price, the DX-77T has solid credentials and great reviews. 160 ~ 10m Amateur Band TX in all modes, general coverage RX 500 KHz ~ 30 MHz, 2 VFOs, internal keyer (6 ~ 50 wpm), 100 memories, 13.8 VDC input, optional computer control capability, CTCSS encoder (front panel programmable), RIT, easy split operation, speech compressor, selectable AGC, large front panel speaker. The value leader in HF desktop radios!

DM-330MV Communications Grade Switching Power Supply

Tiny, powerful, 30A continuous, 32A peak output, weighs less than 5 lbs! Variable output 5 ~ 15 VDC, memory output, rear panel high-current (30A) terminals, triple circuit protection, illuminated V/A meter, ultra-quiet with patent-pending noise-shift circuit. Front panel cigar (10A) and quick-connect (5A) terminals, ripple less than 15mV p-p. Perfect for travel, station or test bench use. There's no switching supply like it! **Also available: DM-340MV IC Regulated Power Supply.**

EDX-2 Automatic Wire Antenna Tuner



Quickly tune wire antenna (from 8 to 80 feet) for any band from 10 through 160 meters (minimum 40 foot wire antenna required for 160 meter use). Perfect for base, mobile or marine use. Plugs directly into Alinco DX-70 and DX-77 transceivers. You don't have to pay more for great performance!

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APRIL 2000
ISSUE #473

THE NEW!

73® Amateur Radio Today

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QRX . . .

Partial Callsigns: What the FCC Rules Say

In a letter to net control operator Alan Strauss WA4JTK, and later on the RAIN Report, the FCC's Special Counsel for Amateur Radio Enforcement, Riley Hollingsworth K4ZDH, has stated that if only the last two letters of a callsign are given, that station identification doesn't meet the requirements of the Amateur Service Part 97 Rules. Hollingsworth also pointed out that if a calling station using an abbreviated callsign suffix is never acknowledged and given a chance to give a complete callsign, a legal station identification would be lacking for that communication.

This report brought a flurry of cheers from many DXers who have been fighting the partial callsign problem for years. But it has also been very controversial with some other DX operators, some contest

Continued on page 6

THE TEAM

El Supremo & Founder
Wayne Green W2NSD/1

Associate Publisher
F. I. Marion

Executive Editor
Jack Burnett

Managing Editor
Joyce Sawtelle

Technical Editor
Larry Antonuk WB9RRT

Contributing Culprits
Mike Bryce WB8VGE
Jim Gray W1XU/7
Jack Heller KB7NO
Chuck Houghton WB6IGP
Andy MacAllister W5ACM
Joe Moell K0OV
Steve Nowak KE8YN/5
Dr. Rick Olsen N6NR

Advertising Sales
Evelyn Garrison WS7A
21704 S.E. 35th St.
Issaquah WA 98029
425-557-9611
Fax: 425-557-9612

Circulation
Frances Hyvarinen

Data Entry & Other Stuff
Norman Marion

Business Office
Editorial - Advertising - Circulation
Feedback - Product Reviews
73 Amateur Radio Today Magazine
70 Hancock Rd.
Peterborough NH 03458-1107
603-924-0058
Fax: 603-924-8613

Reprints: $3 per article
Back issues: $5 each

Printed in the USA

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73 Amateur Radio Today (ISSN 1052-2522) is published monthly by 73 Magazine, 70 N202, Peterborough NH 03458-1107. The entire contents ©2000 by 73 Magazine. No part of this publication may be reproduced without written permission of the publisher, which is not all that difficult to get. The subscription rate is: one year $24.97, two years $44.97; Canada: one year $34.21, two years $57.75, including postage and 7% GST. Foreign postage: $19 surface, $42 airmail additional per year, payable in US funds on a US bank. Second class postage is paid at Peterborough, NH, and at additional mailing offices. Canadian second class mail registration #178101. Canadian GST registration #125393314. Microfilm edition: University Microfilm, Ann Arbor MI 48106. POSTMASTER: Send address changes to *73 Amateur Radio Today*, 70 Hancock Rd., Peterborough NH 03458-1107. Tel. (603) 924-0058. 73 Amateur Radio Today is owned by Shabromat Way Ltd. of Hancock NH.

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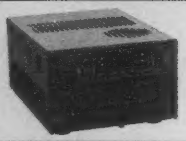


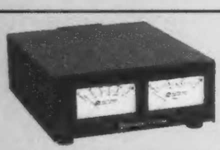
MODEL SS-10TK

MODEL SS-12IF

MODEL SS-18

DESKTOP SWITCHING POWER SUPPLIES

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SS-10	7	10	1⅛ x 6 x 9	3.2
SS-12	10	12	1⅜ x 6 x 9	3.4
SS-18	15	18	1⅜ x 6 x 9	3.6
SS-25	20	25	2⅞ x 7 x 9⅜	4.2
SS-30	25	30	3¾ x 7 x 9⅝	5.0



MODEL SS-25M

DESKTOP SWITCHING POWER SUPPLIES WITH VOLT AND AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SS-25M*	20	25	2⅞ x 7 x 9⅜	4.2
SS-30M*	25	30	3¾ x 7 x 9⅝	5.0

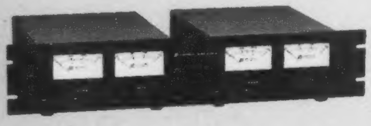
MODEL SRM-30

RACKMOUNT SWITCHING POWER SUPPLIES

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25	20	25	3½ x 19 x 9⅜	6.5
SRM-30	25	30	3½ x 19 x 9⅝	7.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M	20	25	3½ x 19 x 9⅜	6.5
SRM-30M	25	30	3½ x 19 x 9⅝	7.0



MODEL SRM-30M-2

2 ea SWITCHING POWER SUPPLIES ON ONE RACK PANEL

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25-2	20	25	3½ x 19 x 9⅜	10.5
SRM-30-2	25	30	3½ x 19 x 9⅝	11.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M-2	20	25	3½ x 19 x 9⅜	10.5
SRM-30M-2	25	30	3½ x 19 x 9⅝	11.0

MODEL SS-12SM/GTX

MODEL SS-10EFJ-98

CUSTOM POWER SUPPLIES FOR RADIOS BELOW

EF JOHNSON AVENGER GX-MC41
EF JOHNSON AVENGER GX-MC42
EF JOHNSON GT-ML81
EF JOHNSON GT-ML83
EF JOHNSON 9800 SERIES
GE MARC SERIES
GE MONOGRAM SERIES & MAXON SM-4000 SERIES
ICOM IC-F11020 & IC-F2020
KENWOOD TK760, 762, 840, 860, 940, 941
KENWOOD TK760H, 762H
MOTOROLA LOW POWER SM50, SM120, & GTX
MOTOROLA HIGH POWER SM50, SM120, & GTX
MOTOROLA RADIUS & GM 300
MOTOROLA RADIUS & GM 300
MOTOROLA RADIUS & GM 300
UNIDEN SMH1525, SMU4525
VERTEX — FTL-1011, FT-1011, FT-2011, FT-7011

NEW SWITCHING MODELS

SS-10GX, SS-12GX
SS-18GX
SS-12EFJ
SS-18EFJ
SS-10-EFJ-98, SS-12-EFJ-98, SS-18-EFJ-98
SS-12MC
SS-10MG, SS-12MG
SS-101F, SS-121F
SS-10TK
SS-12TK OR SS-18TK
SS-10SM/GTX
SS-10SM/GTX, SS-12SM/GTX, SS-18SM/GTX
SS-10RA
SS-12RA
SS-18RA
SS-10SMU, SS-12SMU, SS-18SMU
SS-10V, SS-12V, SS-18V

*ICS – Intermittent Communication Service

RAMSEY

Doppler Direction Finder

Track down jammers and hidden transmitters with ease! This is the famous WA2EBY DF'er featured in April 99 QST. Shows direct bearing to transmitter on compass style LED display, easy to hook up to any FM receiver. The transmitter - the object of your DF'ing - need not be FM, it can be AM, FM or CW. Easily connects to receiver's speaker jack and antenna, unit runs on 12 VDC. We even include 4 handy home-brew "mag mount" antennas and cable for quick set up and operation! Whips can be cut and optimized for any frequency from 130-1000 MHz. Track down that jammer, win that fox hunt, zero in on that downed Cessna - this is an easy to build, reliable kit that compares most favorably to commercial units costing upwards of $1000.00! This is a neat kit!!

DDF-1, Doppler Direction Finder Kit $149.95

1 GHz RF Signal Generator

A super price on a full featured RF signal generator! Covers 100 KHz to 999.99999 MHz in 10 Hz steps. Tons of features; calibrated AM and FM modulation, 90 front panel memories, built-in RS-232 interface, +10 to -130 dBm output and more! Fast and easy to use, its big bright vacuum florescent display can be read from anywhere on the bench and the handy 'smart-knob' has great analog feel and is intelligently enabled when entering or changing parameters in any field – a real time saver! All functions can be continuously varied without the need for a shift or second function key. In short, this is the generator you'll want on your bench, you won't find a harder working RF signal generator - and you'll save almost $3,000 over competitive units!

RSG-1000B RF Signal Generator $1995.00

Wireless RF Data Link Modules

RF link boards are perfect for any wireless control application; alarms, data transmission, electronic monitoring...you name it. Very stable SAW resonator transmitter, crystal controlled receiver - no frequency drift! Range up to 600 feet, license free 433 MHz band. Encoder/decoder units have 12 bit Holtek HT-12 series chips allowing multiple units all individually addressable, see web site for full details. Super small size - that's a quarter in the picture! Run on 3-12 VDC. Fully wired and tested, ready to go and easy to use!

RXD-433 Receiver & Decoder
RX-433 Data Receiver
TX-433 Data Transmitter
TXE-433 Transmitter & Encoder

RX-433 Data Receiver............ $16.95 TX-433 Data Transmitter............. $14.95
RXD-433 Receiver/Decoder..... $21.95 TXE-433 Transmitter/Encoder..... $19.95

Super Pro FM Stereo Transmitter

Professional synthesized FM Stereo station in easy to use, handsome cabinet. Most radio stations require a whole equipment rack to hold all the features we've packed into the FM-100. Set freq with Up/Down buttons, big LED display. Input low pass filter gives great sound (no more squeals or swishing from cheap CD inputs!) Limiters for max 'punch' in audio - without over mod, LED meters to easily set audio levels, built-in mixer with mike, line level inputs. Churches, drive-ins, schools, colleges find the FM-100 the answer to their transmitting needs, you will too. Great features, great price! Kit includes cabinet, whip antenna, 120 VAC supply. *We also offer a high power export version of the FM-100 fully assembled with one watt of RF power, for miles of program coverage. The export version can only be shipped if accompanied by a signed statement that the unit will be exported.*

FM-100, Pro FM Stereo Transmitter Kit $249.95
FM-100WT, Fully Wired High Power FM-100................ $399.95

World's Smallest TV Transmitters

We call them the 'Cubes'.... Perfect video transmission from a transmitter you can hide under a quarter and only as thick as a stack of four pennies - that's a nickel in the picture! Transmits color or B&W with fantastic quality - almost like a direct wired connection to any TV tuned to cable channel 59. Crystal controlled for no frequency drift with performance that equals models that cost hundreds more! Basic 20 mW model transmits up to 300' while the high power 100 mW unit goes up to 1/4 mile. Their very light weight and size make them ideal for balloon and rocket launches, R/C models, robots - you name it! Units run on 9 volts and hook-up to most any CCD camera or standard video source. In fact, all of our cameras have been tested to mate perfectly with our Cubes and work great. Fully assembled - just hook-up power and you're on the air! One customer even put one on his dog!

C-2000, Basic Video Transmitter..............$89.95 C-2001, High Power Video Transmitter...$179.95

CCD Video Cameras

Top quality Japanese Class 'A' CCD array, over 440 line line resolution, not the off-spec arrays that are found on many other cameras. Don't be fooled by the cheap CMOS single chip cameras which have 1/2 the resolution, 1/4 the light sensitivity and draw over twice the current! The black & white models are also super IR (Infra-Red) sensitive. Add our invisible to the eye, IR-1 illuminator kit to see in the dark! Color camera has Auto gain, white balance, Back Light Compensation and DSP! Available with Wide-angle (80º) or super slim Pin-hole style lens. Run on 9 VDC, standard 1 volt p-p video. Use our transmitters for wireless transmission to TV set, or add our IB-1 Interface board kit for super easy direct wire hook-up to any Video monitor, VCR or TV with A/V input. Fully assembled, with pre-wired connector.

CCDWA-2, B&W CCD Camera, wide-angle lens $69.95
CCDPH-2, B&W CCD Camera, slim fit pin-hole lens.. $69.95
CCDCC-1, Color CCD Camera, wide-angle lens $129.95
IR-1, IR Illuminator Kit for B&W cameras $24.95
IB-1, Interface Board Kit $14.95

AM Radio Transmitter

Operates in standard AM broadcast band. Pro version, AM-25, is synthesized for stable, no-drift frequency and is setable for high power output where regulations allow, typical range of 1-2 miles. Entry-level AM-1 is tunable, runs FCC maximum 100 mW, range 1/4 mile. Both accept line-level inputs from tape decks, CD players or mike mixers, run on 12 volts DC. Pro AM-25 includes AC power adapter, matching case and bottom loaded wire antenna. Entry-level AM-1 has an available matching case and knob set that dresses up the unit. Great sound, easy to build - you can be on the air in an evening!

AM-25, Professional AM Transmitter Kit..... $129.95
AM-1, Entry level AM Radio Transmitter Kit... $29.95
CAM, Matching Case Set for AM-1.......... $14.95

FM Stereo Radio Transmitters

No drift, microprocessor synthesized! Great audio quality, connect to CD player, tape deck or mike mixer and you're on-the-air. Strapable for high or low power! Runs on 12 VDC or 120 VAC. Kit includes snazzy case, whip antenna, 120 VAC power adapter - easy one evening assembly.

FM-25, Synthesized Stereo Transmitter Kit $129.95

Lower cost alternative to our high performance transmitters. Great value, easily tunable, fun to build. Manual goes into great detail about antennas, range and FCC rules. Handy for sending music thru house and yard, ideal for school projects too - you'll be amazed at the exceptional audio quality! Runs on 9V battery or 5 to 15 VDC. Add matching case and whip antenna set for nice 'pro' look.

FM-10A, Tunable FM Stereo Transmitter Kit................. $34.95
CFM, Matching Case and Antenna Set $14.95
FMAC, 12 Volt DC Wall Plug Adapter........................ $9.95

Mini Radio Receivers

Imagine the fun of tuning into aircraft a hundred miles away, the local police/fire department, ham operators, or how about Radio Moscow or the BBC in London? Now imagine doing this on a little radio you built yourself - in just an evening! These popular little receivers are the nuts for catching all the action on the local ham, aircraft, standard FM broadcast radio, shortwave or WWV National Time Standard radio bands. Pick the receiver of your choice, each easy to build, sensitive receiver has plenty of crystal clear audio to drive any speaker or earphone. Easy one evening assembly, run on 9 volt battery, all have squelch except for shortwave and FM broadcast receiver which has subcarrier output for hook-up to our SCA adapter. The SCA-1 will tune in commercial-free music and other 'hidden' special services when connected to FM receiver. Add our snazzy matching case and knob set for that smart finished look!

AR-1, Airband 108-136 MHz Kit................. $29.95
HFRC-1, WWV 10 MHz (crystal controlled) Kit..... $34.95
FR-1, FM Broadcast Band 88-108 MHz Kit $24.95
SR-1, Shortwave 4-11 MHz Band Kit $29.95
SCA-1 SCA Subcarrier Adapter kit for FM radio.... $27.95
FR-6, 6 Meter FM Ham Band Kit $34.95
FR-10, 10 Meter FM Ham Band Kit.......... $34.95
FR-146, 2 Meter FM Ham Band Kit.......... $34.95
FR-220, 220 MHz FM Ham Band Kit.......... $34.95
Matching Case Set (specify for which kit).... $14.95

RF Power Booster

Add muscle to your signal, boost power up to 1 watt over a freq range of 100 KHz to over 1000 MHz! Use as a lab amp for signal generators, plus many foreign users employ the LPA-1 to boost the power of their FM transmitters, providing radio service through an entire town. Runs on 12 VDC. For a neat finished look, add the nice matching case set. Outdoor unit attaches right at the antenna for best signal - receiving or transmitting, weatherproof, too!

LPA-1, Power Booster Amplifier Kit $39.95
CLPA, Matching Case Set for LPA-1 Kit $14.95
LPA-1WT, Fully Wired LPA-1 with Case $99.95
FMBA-1, Outdoor Mast Mount Version of LPA-1 .... $59.95

PIC-Pro Pic Chip Programmer

Easy to use programmer for the PIC16C84, 16F84, 16F83 microcontrollers by Microchip. All software - editor, assembler, run and program - as well as free updates available on Ramsey download site! This is the popular unit designed by Michael Covington and featured in Electronics Now, September 1998. Connects to your parallel port and includes the great looking matching case, knob set and AC power supply. Start programming those really neat microcontrollers now...order your PICPRO today!

PIC-1, PICPRO PIC Chip Programmer Kit $59.95

FM Station Antennas

For maximum performance, a good antenna is needed. Choose our very popular dipole kit or the Comet, a factory made 5/8 wave colinear model with 3.4 dB gain. Both work great with any FM receiver or transmitter.

TM-100, FM Antenna Kit.................. $39.95
FMA-200, Vertical Antenna $114.95

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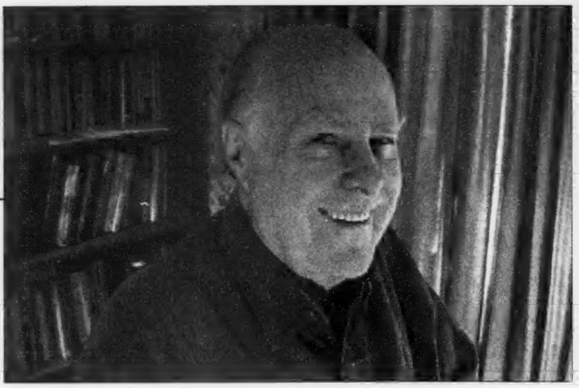

It's Spring!

The wildflowers are starting to bloom in the north pasture. The FCC, despite the ARRL (or was it to spite the ARRL?), virtually eliminated the Morse Code barrier to licenses, and they also okayed low power FM stations.

Things Are Looking Up!

First, the flowers. I'll be out there with my new Sony digital camera snapping close-ups of the profusion of New Hampshire wildflowers as they bloom and putting them on my Web site so that you can eat your heart out.

Second, business has already picked up for my One Hour 5 WPM Code book. Actually, if you follow my instructions, it shouldn't take you more than a half-hour of study to be able to pass the 5 wpm test. I used that system when I was a Boy Scout, and it took me 20 minutes.

My book also explains the simplest way there is to learn to copy code at higher speeds, without weeks of traumatic practice.

Third, low-powered FM stations present a golden opportunity for a few hams with initiative. Somewhere around a thousand small organizations are going to want to get involved, and they aren't going to know diddly about how to go about it.

They're going to need a transmitter, antenna, operating console, microphones, CD and tape players, telephone connections for on-the-air interviews, a delay system for ditto, and so on. They'll need installation and maintenance. If they're going to pick up any programming from satellite feeds, they'll need the equipment for that. They may even want to build a small studio. They'll also need handholding on getting their license. I doubt it'll be long before special equipment is available for this market.

Your Help

I'd like to get more hams to read the magazine, and you can help. I love getting phone calls, E-mail, and letters from readers who enjoy the magazine and my editorials. But subscription letters to nonsubscribers with my telling them this won't mean much. However, if I could include a testimonial from you explaining how much you enjoy the magazine, or even how I've helped change your life, that might be more compelling.

There are over 600,000 hams out there who have no idea how much fun the magazine is, How it can help them get a lot more fun out of the hobby, or how my editorials might help them to live healthier, more successful lives. If we can get even a sixth of them to subscribe, you'll see the fattest ham magazine in the world, packed with advertising and tons of interesting articles. I'd love to publish a DXpedition-of-the-month article. And a continuing series explaining how newcomers can get involved with packet, satellites, slow scan, RTTY, foxhunting, and so on. I'd love to include book sections, as I have in the past. I ran a coax handbook in the magazine that became a standard reference manual for years. I'd love to include a VHF antenna handbook, and so on.

Then there's my old ad sales manager W7DXX, now in business with a Kachina rig interfaced with the Internet so anyone with the access code (yes, you have to be licensed) can get on the air, tune the band, and rotate his beam. His first user was a ham in Singapore! I'd love to publish a hundred articles explaining how you can do mischief like that.

Remember, anyone can talk over your rig as long as you're "in control." But the FCC regs don't explain what "in control" means. At the very least, interfaces such as DXX's will enable Techs to get on the air and work some rare DX. I'll bet we'll have remote base stations like that springing up all around the world.

So, please give me a hand. If you're enjoying my present thin magazine, you're going to go wild over it when we get it fattened up like it used to be. Heck, we used to run 200 pages and more, and we can again — with your help.

Send your letters to Wayne Green, Box 700, Antrim NH 03440, or E-mail me at w2nsd@aol.com.

Beck, et al.

Since I can't get you to record the Art Bell show, you missed hearing Bob Beck being interviewed about his blood purifier. Tsk. I've published two construction articles on this device in *73*, calling it the Bioelectrifier. The back issues sold out instantly, but you can get a reprint, along with a history of the blood purifier, from my ad on page 63.

The process was discovered serendipitously by Drs. Lyman and Kaali of the Albert Einstein College of Medicine ten years ago. Dr. Kaali has gotten three patents on the process, yet little word of their discovery has ever been released.

As Beck reported, Dr. Kaali's patent application claimed that the process of passing a microcurrent through the blood would eliminate any virus, microbe, yeast, parasite, or fungus — including HIV. In trials with a local hospital, the Bioelectrifier was curing AIDS and a wide variety of other illnesses. Even cancer!

I've been making Bioelectrifier information available for over six years, and the letters of thanks I've been getting make the effort worth it. I only wish I could let more people know that cancer has been easily and inexpensively cured. I've reliable reports of emphysema and a host of other illnesses being resolved.

Well, it makes sense, as I've written many times. If you clean viruses, microbes, and so on out of your blood, your immune system will be better able to rebuild itself, and it's the immune system that's doing the real work.

But through the lifestyles we inherit from our parents and grandparents, which are reinforced by our media, we're poisoning our bodies, denying ourselves the nutrition we are designed to need, giving ourselves far too little pure water, sunlight, and exercise, and too much stress. Talk about throwing monkey wrenches into the machinery!

Drs. Kaali and Lyman both refused to be interviewed for the show.

Is it really possible that there's an inexpensive cure for AIDS and cancer that the medical industry is trying to hide? Just follow the money, my friend.

An outfit started selling plant growth stimulators, which have the same circuit as the Bioelectrifier, from Colorado, but the FDA forced them to move to Canada, where the device is not yet illegal to sell. There's still one source in the U.S., but it too may have to move to Canada. The Colorado company sells a kit for $100; Butterfly Products has a completely built plant growth stimulator, all ready to make your plants grow like crazy, for $155 ppd., and it comes with silver wires for making silver colloid as a bonus. You can, at least for now, order it from Box 1729, Hillsboro NH 03244.

If you want to stop missing critically important Art Bell shows like this one, start recording it on your VCR every night so that you won't miss the better shows. For $5, you can get Wayne's Bell Saver Kit, which has the necessary patch cable and instructions. Art's show, which runs from 10 p.m. to 3 a.m. PST, mainly attracts

Continued on page 8

Big Savings on Radio Scanners

COMMUNICATIONS ELECTRONICS INC.

Order on-line and get big savings

Take advantage of *73 Amateur Radio* special savings by entering your order directly on the internet at the Communications Electronics web site. Visit CEI at http://www.usascan.com, click on "CEI News" and get big E-Value savings. Resellers, get special pricing when you fax your sales tax license to CEI at +1-734-663-8888.

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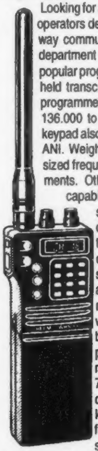
SAVE$30 on one Relm MPV32

Save $30 when you purchase your RELM MPV32 transceiver directly from Communications Electronics Inc. For fast delivery, enter your order through our web site http://www.usascan.com or call Communications Electronics at 1-800-USA-SCAN. TERMS: Good only in USA & Canada. Only one coupon is redeemable per purchase. Void where prohibited.

RELM® MPV32-A Transceiver

Mfg. suggested list price $515.00/**Special $299.95**



Looking for a great hand-held two-way transceiver? Amateur radio operators depend on the RELM MPV32 transceiver for direct two-way communications with their ham radio repeater, fire, police department or civil defense agency. The MPV32 is our most popular programmable frequency agile five watt, 32 channel hand-held transceiver that has built-in CTCSS. This feature may be programmed for any 39 standard EIA tones. Frequency range 136.000 to 174.000 MHz. The full function, DTMF compatible keypad also allows for DTMF Encode/Decode and programmable ANI. Weighing only 15.5 oz., it features programmable synthesized frequencies either simplex or half duplex in 2.5 KHz. increments. Other features include PC programming and cloning capabilities, scan list, priority channel, selectable scan delay, selectable 5 watt/1 watt power levels, liquid crystal display, time-out timer and much more. When you order the MPV32 from CEI, you'll get a complete package deal including antenna, 700 ma battery (add $20.00 to substitute a 1000 ma battery), battery charger, belt clip and user operating instructions. Other useful accessories are available. A heavy duty leather carrying case with swivel belt loop part **#LCMP** is $49.95; rapid charge battery charger, part **#BCMP** is $69.95; speaker/microphone, part **#SMMP** is $54.95; extra high capacity 1000 ma. ni-cad battery pack, part **#BPMP1** is $79.95; extra 700 ma. ni-cad battery pack, part **#BPMP7** is $59.95; cloning cable part **#CCMP** is $34.95; PC programming kit, part **#PCKIT030** is $224.95. A UHF version with a frequency range of 450-480 MHz. part **#MPU32** is on special for $299.95. Your RELM radio transceiver is ideal for many different applications since it can be programmed with just a screwdriver and programming instructions in less than 10 minutes. Programming is even faster with the optional PC kit. The programming instructions part **#PIMPV** is $19.00. Call 1-800-USA-SCAN to order.

Bearcat®895XLT-A1 Radio Scanner

Mfg. suggested list price $729.95/**Special $194.95**

300 Channels • 10 banks • Built-in CTCSS • S Meter

Size: 10-1/2" Wide x 7-1/2" Deep x 3-3/8" High

Frequency Coverage: 29.000-54.000 MHz., 108.000-174 MHz., 216.000-512.000 MHz., 806.000-823.995 MHz., 849.0125–868.995 MHz., 894.0125-956.000 MHz.

The Bearcat 895XLT is superb for intercepting trunked communications transmissions with features like TurboScan™ to search VHF channels at 100 steps per second. This base and mobile scanner is also ideal for intelligence professionals because it has a Signal Strength Meter, RS232C Port to allow computer-control of your scanner via optional hardware and 30 trunking channel indicator annunciators to show you real-time trunking activity for an entire trunking system. Other features include ***Auto Store*** – Automatically stores all active frequencies within the specified bank(s). ***Auto Recording*** – Lets you record channel activity from the scanner onto a tape recorder. ***CTCSS Tone Board*** (Continuous Tone Control Squelch System) allows the squelch to be broken during scanning only when a correct CTCSS tone is received. For maximum scanning enjoyment, order the following optional accessories: **PS001** Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter $14.95; **PS002** DC power cord - enables permanent operation from your vehicle's fuse box $14.95; **MB001** Mobile mounting bracket $14.95; **EX711** External speaker with mounting bracket & 10 feet of cable with plug attached $19.95. The BC895XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO, EDACS, ESAS or LTR systems.

TrunkTracking Radio

DISTRIBUTOR'S COUPON | Expires 03/31/2000 | #991127

SAVE $70 on one BC245XLT

Save $70 when you purchase your Bearcat 245XLT scanner directly from Communications Electronics Inc. For fast delivery, enter your order through our web site http://www.usascan.com or call Communications Electronics at 1-800-USA-SCAN. TERMS: Good only in USA & Canada. Only one coupon is redeemable per purchase. Void where prohibited.

Bearcat® 245XLT-A TrunkTracker

Mfg. suggested list price $429.95/**CEI price $269.95**

300 Channels • 10 banks • Trunk Scan and Scan Lists

Trunk Lockout • Trunk Delay • Cloning Capability

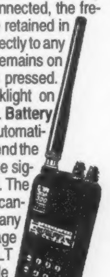
10 Priority Channels • Programmed Service Search

Size: 2-1/2" Wide x 1-3/4" Deep x 6" High

Frequency Coverage:

29.000-54,000 MHz., 108-174 MHz., 406-512 MHz., 806-823.995 MHz., 849.0125–868.995 MHz., 894.0125-956.000 MHz.

Our new Bearcat TrunkTracker BC245XLT, is the world's first scanner designed to track Motorola Type I, Type II, Hybrid, SMARTNET, PRIVACY PLUS and EDACS®analog trunking systems on any band. Now, follow UHF High Band, UHF 800/900 MHz trunked public safety and public service systems just as if conventional two-way communications were used. Our scanner offers many new benefits such as **Multi-Track** – Track more than one trunking system at a time and scan conventional and trunked systems at the same time. **300 Channels** – Program one frequency into each channel. **12 Bands, 10 Banks** – Includes 12 bands, with Aircraft and 800 MHz. 10 banks with 30 channels each are useful for storing similar frequencies to maintain faster scanning cycles or for storing all the frequencies of a trunked system. **Smart Scanner** – Automatically program your BC245XLT with all the frequencies and trunking talk groups for your local area by accessing the Bearcat national database with your PC. If you do not have a PC simply use an external modem. **Turbo Search** – Increases the search speed to 300 steps per second when monitoring frequency bands with 5 KHz. steps. **10 Priority Channels** – You can assign one priority channel in each bank. Assigning a priority channel allows you to keep track of activity on your most important channels while monitoring other channels for transmissions. **Preprogrammed Service (SVC) Search** – Allows you to toggle through preprogrammed police, fire/emergency, railroad, aircraft, marine, and weather frequencies. **Unique Data Skip** – Allows your scanner to skip unwanted data transmissions and reduces unwanted birdies. **Memory Backup** – If the battery completely discharges or if power is disconnected, the frequencies programmed in your scanner are retained in memory. **Manual Channel Access** – Go directly to any channel. **LCD Back Light** – An LCD light remains on for 15 seconds when the back light key is pressed. **Autolight** – Automatically turns the backlight on when your scanner stops on a transmission. **Battery Save** – In manual mode, the BC245XLT automatically reduces its power requirements to extend the battery's charge. **Attenuator** – Reduces the signal strength to help prevent signal overload. The BC245XLT also works as a conventional scanner. Now it's easy to continuously monitor many radio conversations even though the message is switching frequencies. The BC245XLT comes with AC adapter, one rechargeable long life ni-cad battery pack, belt clip, flexible rubber antenna, earphone, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO, ESAS or LTR systems. Hear more action on your radio scanner today. Order on-line at http://www.usascan.com for quick delivery.



VHF/GMRS/CB Radios

Have fun and use our CB, GMRS, shortwave and commercial radios to keep in touch with the world, friends and family.

Cobra 148GTL-A3 SSB CB/SPECIAL	$114.95
Maxon HCB40WX handheld CB with 10 weather ch.	$69.95
RELM RH256NB-A 25 watt VHF mobile transceiver	$284.95
RELM SMV4099W-A 40 watt VHF mobile transceiver	$349.95
RELM RMV60B-A 60 watt VHF mobile transceiver	$699.95
Uniden GRANTXL-A SSB CB Mobile	$124.95
Sangean ATS909-A shortwave receiver	$229.95
Sangean ATS818CS-A shortwave receiver	$199.95

Radio Scanners

Monitor fire, police, weather, marine, medical, aircraft and other transmissions with your radio scanner from CEI.

AOR8200B-A wideband handheld scanner/SPECIAL	$519.95
AOR5000+3-A desktop receiver with synch AM/AFC/NB	$2,399.95
AOR AR16BQ wideband handheld scan with quick charger	$209.95
Bearcat 9000XLT-A 500 channel base/mobile scanner	$344.95
Bearcat 895XLT-A1 300 ch.TrunkTracker base scanner	$194.95
Bearcat 278CLT-A 100 ch base AM/FM/SAME WX alert	$169.95
Bearcat 248CLT-A 50 ch.base AM/FM/weather alert scanner	$99.95
Bearcat 245XLT-A 300 channel TrunkTracker II scanner	$269.95
Bearcat Sportcat 200 alpha handheld sports scanner	$184.95
Bearcat Sportcat 180B handheld sports scanner	$149.95
Bearcat 80XLT-A2 50 channel handheld scanner	$109.95
Bearcat 60XLT1-A 30 channel handheld scanner	$79.95
Bearcat BCT12-A2 Stormtracker info mobile scanner	$144.95
Bearcat BCT7-A information mobile scanner	$149.95
ICOM ICR8500-A1 wideband communications receiver	$1,499.95
ICOM PCR1000-A1 computer communications scanner	$399.95
ICOM R10-A1 handheld wideband communications rec.	$339.95

AOR® AR8200B Radio Scanner

Mfg. suggested list price $799.95/**Special $519.95**

1,000 Channels • 20 banks • 50 Select Scan Channels

PASS channels: 50 per search bank + 50 for VFO search

Frequency step programmable in multiples of 50 Hz.

Size: 2-1/2" Wide x 1-3/8" Deep x 6-1/8" High

Frequency Coverage:

500 KHz to 823.995 MHz, 849.0125–868.995 MHz, 894.0125-2,040.000 MHz (Full coverage receivers available for export and FCC approved users.)

The AOR AR8200B is the ideal handheld radio scanner for communications professionals. It features all mode receive: WFM, NFM, SFM (Super Narrow FM), WAM, AM, NAM (wide, standard, narrow AM), USB, LSB & CW. Super narrow FM plus Wide and Narrow AM in addition to the standard modes. The AR8200 also has a versatile multi-function band scope with save trace facility, twin frequency readout with bar signal meter, battery save feature with battery low legend, separate controls for volume and squelch, arrow four way side rocker with separate main tuning dial, configuarable keypad beep/illumination and LCD contrast, write protect and keypad lock, programmable scan and search including LINK, FREE, DELAY, AUDIO, LEVEL, MODE, computer socket fitted for control, clone and record, Flash-ROM no battery required memory, true carrier re-insertion in SSB modes, RF preselection of mid VHF bands, Detachable MW bar aerial. Tuning steps are programmable in multiples of 50 Hz in all modes, 8.33 KHz airband step correctly supported, Step-adjust, frequency offset, AFC, Noise limited & attenuator, Wide and Narrow AM in addition to the standard modes. For maximum scanning pleasure, you can add one of the following optional slot cards to this scanner: **CT8200** CTCSS squelch & search decoder $89.95; **EM8200** External 4,000 channel backup memory, 160 search banks. $69.95; **RU8200** about 20 seconds chip based recording and playback $69.95; **TE8200** 256 step tone eliminator $59.95. In addition, two leads are available for use with the option socket. **CC8200** PC control lead with CD Rom programming software $109.95; **CR8200** tape recording lead $59.95. The AR8200B comes with 4 AA ni-cad batteries, charger, cigar lead, whip aerial, MW bar antenna, belt hook, strap and one year limited AOR warranty. Enter your order now at http://www.usascan.com.

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operators, and the control stations for numerous foreign DX spotting nets. Some of the control operators for these nets are very vocal in opposing full callsigns. They say that a full callsign wastes time. And there are even reports that some overseas net operators are turning away US stations that try to sign in using their full calls.

But the bottom line is that hams in the United States are not regulated by the DX operators government. Rather, United States hams fall under the guidance of the FCC. It is the FCC that has determined how and how often a United States license holder must identify. It's covered under Part 97.119(a) of the United States Amateur Service Rules. It's also something that all US hams are supposed to know, and it reads as follows:

"Each amateur station, except a space station or telecommand station, must transmit its assigned callsign on its transmitting channel at the end of each communication, and at least every ten minutes during a communication, for the purpose of clearly making the source of the transmissions from the station known to those receiving the transmissions. No station may transmit unidentified communications or signals, or transmit as the station callsign, any callsign not authorized to the station."

The operative words appear to be the reference to identifying at the end of a transmission. Also identifying every ten minutes if a single transmission exceeds that length of time.

By way of example: Suppose you call another station, or sign into a net, using only the last two letters of your call. You are acknowledged but never given a chance to make another transmission. As a result, you have violated section 97.119(a).

To make your transmission legal, you must find a way to properly identify at some point in the communication with complete call. And — in the heat of the battle for a rare DX contact or in dealing with some non-US nets, that might not be so easy.

Thanks to Robert Sudock WB6FDF, reporting in Newsline, *Bill Pasternak WA6ITF, editor.*

Ishmod 2000

After our update on Ishmod Kaduk S7Z2B last year, word has continued to filter in to our New Hampshire offices with news about possible sightings or further information about the hard-luck DXer. Readers may recall that while on a DXpedition in the South China Sea in 1963, Kaduk and his four companions vanished shortly after stumbling across some kind of different propagation phenomena. Or pirates. (The complete story can be found in our April 1984 and April 1985 issues.)

Last year, we were pleased (and astonished) to report two possible sightings of Ishmod during the civil unrest in Indonesia, but apparently further investigation in that country has proved fruitless.

Nonetheless, since last spring we have received three further bits of news that we ask readers to follow up on if at all possible, while we continue to do the same. It seems that April is always the time to report on this to you.

First, the waters off Chilka Lake, the district of India from which the DXpedition departed, apparently were mentioned at least once last year on the syndicated Arch Bell radio show. We are looking into that.

Also, it turns out that the exact location of the phenomena/disappearance, "200 air miles south of Calcutta," along with a description of radio wave behavior there, may be mentioned in the book *Area 51: Personal Stories* by Lt. Col. Ruben Barnett (USAF, Ret.). Several readers who have sought this book report that it mysteriously disappeared from booksellers' shelves about four years ago. If anybody has a copy, we would sure like to see it here at *73.*

Finally, we have reports that an apparent pirate of the radio kind has been heard occasionally using Ishmod's call, if not his name, in Southern California. DFing efforts have always led to Riverside, where hunters always seem to be thwarted by so-called "smart" rock formations.

We continue to seek information about Ishmod and his companions, and would be happy to print any relevant news, comments, or suggestions from readers.

K7GE SK

Jim Larsen K7GE passed away in early February. Jim was the founder of Larsen Antenna, and a ham for some 67 years. A contester, DXer, FOCer, CW enthusiast, experimenter, and mad scientist, Jim loved this hobby and contributed much to it. He will truly be missed by many in the ham community. — W2NSD/1.

AO-10 QSB Alarm

Houston's Jerry Brown K5OE says that there appears to be an alarm of sorts that he has noticed that alerts him when AO-10 is emerging from a deep fade. It manifests itself as a low-volume carrier moving across the passband from high frequency to low frequency at about 1 Hz and about 3 dB above the band noise. Jerry says that all he needs to do is to keep his receiver set to the downlink of 145.904 MHz. He can then go about his other business until he hears the telltale carrier as it travels by this frequency. Invariably, the next attempt at an uplink to AO-10 produces a return.

Thanks to Newsline, *Bill Pasternak WA6ITF, editor.*

Top 10 April Fool's Pranks for the Amateur Radio Operator

10. Use a rare DX callsign and turn the power down so you sound like you're really far away.

9. Get on the DX reflector and report an opening into your local repeater.

8. Send Morse code backwards, ?LSQ

7. Find a guy with a linear and tell him "Your signal is all crackly like your finals are going, old man."

6. Call CQ DX on CB Channel 9.

5. Phone your local TV station and tell them you are a ham radio operator in contact with aliens, then patch in the repeater.

4. Start at 5 watts, slowly decrease power until the other station can't copy, then kick in the linear and blow his ears off.

3. Pretend you are an AM broadcast station and play a bunch of old records in the 20m phone band.

2. Pretend your 2m HT is a cell phone and you're trying to call one of those phone-sex numbers, but you're really on the repeater.

And the Number 1 April Fool's Prank for the Amateur Radio Operator:

1. Restructure the hobby.

Thanks to Low Down, official journal of the Colorado QRP Club [cqc@aol.com].

Vast Majority of Hams Not ULS-Ready

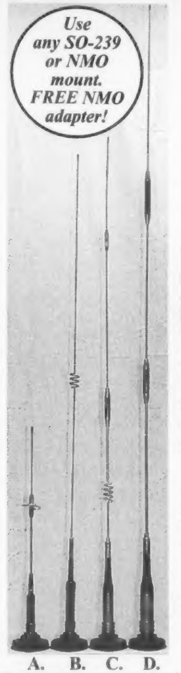
Even though registration has been available for approximately two years now, most Amateur Radio licensees have yet to register with the FCC's Universal Licensing System. The ULS Task Force reports that, as of mid-November 1999, 682,212 amateurs still had not registered. This figure includes individuals whose licenses have lapsed but remain in the two-year grace period. The FCC recently said approximately 3% of US licensees had registered with the ULS.

The FCC deployed the ULS for the Amateur Service on August 16, 1999. Amateurs must be registered in the ULS in order to file applications with the FCC — including renewals, modifications, and vanity callsign requests.

The ULS Task Force also wants amateur applicants to know that if they apply too early for license renewal, their applications will be dismissed. A license renewal must be filed no sooner than within 90 days of expiration, even if coupled with a license modification. This is only an issue for those filing paper applications; the electronic filing system will not let applicants file prematurely.

Continued on page 60

MFJ *RuffRider*™ High Gain Mobile Antennas



Use any SO-239 or NMO mount. FREE NMO adapter!

Shown on mini mag mounts, not included.

Each MFJ RuffRider™ mobile antenna comes with MFJ's unique 90 degree "fold-over" feature – lets you pull into your garage without knocking your antenna over!

MFJ's heavy duty bases are extremely strong to handle super rugged rides and day-to-day highway abuse.

MFJ's *RuffRider*™ High Gain dual band 144/440 MHz mobile antenna series is for the serious mobile ham who demands the highest quality, premium products at reasonable prices.

They feature the finest quality construction using precision machined components. *RuffRiders*™ battle the elements, handle rugged rides and day-to-day highway abuse.

Stacked elements with high-Q phasing coils give you outstanding gain. Stay in solid contact!

Phased Radiators

Phased radiators flattens the radiation pattern and concentrates your power to give you *super gain.*

High-Q phasing coils are housed in weather proof high-tech plastic insulation. They're attached to stainless steel stacked radiators by solid metal end sections.

Heavy Duty Base

Rigid, heavy duty solid metal base reduces SWR flutter due to wind vibration. Two Allen set screws securely fastens radiator.

Specially treated center pin provides excellent electrical connection.

Quickly screws off -- helps prevents theft of your expensive rig.

Use SO-239 or NMO Mounts

RuffRiders™ have a PL-259 base mount for quick installation to your heavy duty SO-239 magnet, trunk/hatch, gutter or mirror mount.

A *free* NMO adapter is included for use with an NMO mount.

MFJ mounts are recommended.

All MFJ *RuffRiders*™ are dual band 144/440 MHz antennas and factory tuned for SWR less than 1.5:1 and have 50 Ohm impedance.

MFJ's *No Matter What*™ Warranty

All *RuffRider*™s are covered by MFJ's famous *No Matter What*™ one year limited warranty. MFJ will repair or replace (at our option) your antenna for one full year.

Choose from several different length and gain antennas . . .

A. ***RuffRider Junior*™.** Premium, short 16½" antenna fits in any garage on any auto. ¼ Wave on 2 Meters, ½ Wave, 3 dB gain on 440 MHz. 100 Watts. No fold-over.
MFJ-1402 **$34.95** add s/h

B. ***RuffRider High Power*™.** Just 40" long handles full *200 Watts.* Great for high power mobile amp. ½ Wave, 3 dB gain on 2 Meters, ⅝ Wave, 5.5 dB gain on 440 MHz.
MFJ-1412 **$49.95** add s/h

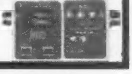
C. ***RuffRider High Gain*™.** 41½" long antenna gives extra gain with little height increase. Handles 150 Watts. ½ Wave, 3.2 dB gain on 2 Meters, ⅝ Wave, 5.7 dB gain on 440 MHz.
MFJ-1422 **$49.95** add s/h

D. ***RuffRider Hyper Gain*™.** 62½" brute gives a whopping 5 dB gain on ⅞ Wave 2 Meters, ⅝ Wave, 7.6 dB gain on 440 MHz. Our highest gain antenna. Handles 150 Watts.
MFJ-1432 **$69.95** add s/h

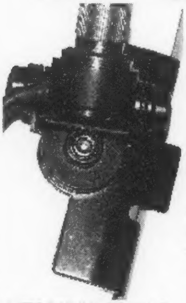
144/440 MHz Antenna Tuner with
built-in SWR/Wattmeter

Covers 136 to 175 MHz. Handles 150 Watts. Compact 4x2½x1¼".

New! **MFJ-922** **$79.95**



MFJ *RuffRider*™ super heavy duty Antenna Mounts



MFJ-345 Lip Mount is shown mounted vertically to a mini-van's angled hatchback lip. Note extra-wide mount with reinforcing tab at right -- safely secures heavy antennas. Swivel mount is adjusted so antenna is near vertical away from mini-van to clear luggage rack.

Trunk/Hatchback *Lip* Mount

MFJ-345 **$34.95** add s/h

MFJ's *RuffRider*™ super heavy duty solid steel Trunk/Hatchback *Lip* Mount mounts to any lip on your vehicle.

Extra-wide *four* inch lip and large reinforcing tabs on each side safely distributes the load over your vehicle's lip.

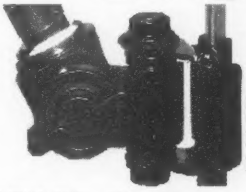
Two large set screws on each end of the mounting lip locks your mount in place. A scratch-proof rubber guard protects your vehicle's finish.

Secures large VHF, UHF and medium size HF antennas even at highway speeds.

Mounts on lips at any angle. Two axis of rotation lets you position your antenna vertically, horizontally or at any desired angle. Serrated swivel joints locks securely in place with huge 3/8 inch set screw.

Has SO-239 base mount. Use adapter for NMO. Includes low loss coax with PL-259 connector, Allen wrenches and protection caps for SO-239 and locking screw, One year MFJ *No Matter What*™ limited warranty.

Mirror/Luggage *Pipe Clamp* Mount



MFJ-340 Pipe Clamp Mount is shown clamped solidly to vertical mirror support rod on a pickup truck. Antenna is slightly swiveled to the left and positioned about 30 degrees from vertical to clear cab of the pickup truck.

MFJ-340 **$34.95** add s/h

MFJ's *RuffRider*™ Mirror/Luggage *Pipe Clamp* Mount mounts on support rod of mirror, luggage rack or spare tire carrier of your truck, van, RV or SUV. Mounts on any horizontal, vertical or angled rod or pipe up to 5/8 inches in diameter.

Secures VHF, UHF and medium size HF antennas even at highway speeds.

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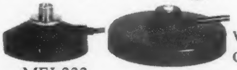
Fold down your antenna at night when pulling into your garage and quickly put it back up to its operating position in the morning.

Has SO-239 base mount. Use adapter for NMO. Includes low loss coax with PL-259 connector, Allen wrenches and protection caps for SO-239 base mount and locking screw, MFJ's famous One year *No Matter What*™ limited warranty.

MFJ's *MaxStrength*™ Hi-Flux Antenna Magnet Mounts



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NEVER SAY DIE

continued from page 4

seniors who have trouble sleeping, all-night truckers, and prisoners. Day people have been missing out on some mighty interesting guests.

Terry

I haven't been reading through the longer and longer Silent Key section of *QST*, so I missed the listing of Terry Sterman W9DIA, the guy who started Amateur Electronic Supply. A letter from Ed Moore KK4ZY, now in Kosovo, mentioned that Terry, at 50, had committed suicide in early 1999.

Terry built a huge ham store business, and how he did it is an interesting story. Here's what he told me about it.

His father had a store in Milwaukee selling schlock furniture (cheap and gaudy). Terry, like most of us in those days, when 80% of all new hams were teenagers, got interested in ham radio while in high school. So, instead of spending four years in college, he wanted to start a ham store. His father let him use a section of his store, and explained that if he wanted to have his business grow quickly, he'd have to compete with Allied Radio in Chicago on prices. To get the new business started, Terry sold ham gear at below cost, with his father paying all the invoices for him.

I talked with Terry at the time, and he said his goal was to put Allied Radio out of business. Allied was, I believe, the largest seller of ham equipment in the country at the time. A couple of years later, Allied sold out to Radio Shack, was out of the ham business, and Terry was opening more AES stores.

Around 1971, when the repeater phenomenon was going into high gear, I met Terry at a hamfest. We were both weighing in at around 235 pounds. We were both fat. Well, I decided enough was enough with the fat, so I went on a diet and dropped 85 pounds. When I met Terry a couple years later at a Miami hamfest, I was 160 pounds and he was at around 350.

Terry would call every now and then to buy ads in *73*. He'd always start out by telling me how incredibly poorly my magazine was doing for him as compared to the others. Then he'd ask for a big discount in the ad rates to make up for our poor performance. His ploy never worked. With my other advertisers telling me that they were getting more sales per advertising dollar with *73* than any of the other ham magazines, and by a wide margin, I knew this was just the usual Terry baloney.

Knowing what I do now about what diet can do, not only to the body, but to the mind, I was not surprised when Ed mentioned that Terry was manic-depressive, that he'd been declared legally incompetent, and had lost control of AES. The doctors, of course, gave him medication instead of going after the cause (his diet).

I sure wish that someone had cared enough about Terry to (a) get a copy of my *Secret Guide to Health* to him and (b) convince him to change his lifestyle.

Sure, a lot of hams think Wayne's crazy for believing that I've found the cause of all illnesses, and the way to cure them. The almost universal belief in doctors is so deeply ingrained that it's virtually unshakable, no matter how glaring the evidence. My joy is in getting phone calls and letters from people my book has rescued. Like a call yesterday from a chap who had been dying of emphysema. He could only walk up a few stairs at a time without resting for minutes, and lived most of the time with an oxygen bottle. After a few weeks of my program, he had no more lung problems and was running upstairs.

If only! Sigh. If I'd been able to get Barry Goldwater K7UGA to read my book, I believe he'd be alive today and out there climbing his tower to fix his beam at 90. King Hussein JY1's total belief in doctors killed him. As I say, "Hold the mayo." Ditto Jean Shepherd K2ORS, who was only a little older than I. What a tremendous talent we lost there!

We have all been so solidly brainwashed that when I come along and ask that you at least consider an alternative, and I review a book which will help you get a better perspective, I'm dismissed as crazy.

If you believe in doctors, our public schools, politicians, college, a job, and so on, you are a victim, just like Terry. My *Secret Guide to Wisdom* will help you educate yourself and blow away much of the brainwashing.

American Know-How

How come the Toyota Camry is the best selling car in America — for the third year running? And second is the Honda Accord? Ford came in third (!) with their Taurus, and Honda fourth with the Civic? Fifth? The Ford Escort.

How come General Motors can't place a car in the top five in sales? Or Chrysler? Are the Japanese better engineers than Americans? Better at production? Better marketers? What's happened to the vaunted American ingenuity?

My wife just bought a Honda Odyssey van. It was the navigator accessory that sold her, I'm sure. Her excuse was that she couldn't drive the Mazda truck I'd gotten last year. It didn't have power steering, it had a manual shift, and the engine tended to stall instead of idle. I bought it used just to use around the farm, and for moving a warehouse full of CDs to our barn. It was fine for what I needed.

So we traded it in on a new Honda van. It has two side doors that slide open and shut at the press of a button on a little remote control. Being a man, naturally I've never had any problem with getting lost, but my wife can get lost driving home from the post office after dark, so the map with a global positioning arrow is great for her.

It's got a great radio, with twelve FM channels and six AM, plus a CD player. It's easy to drive and comfortable. And it has as much room in the back as my truck did!

So, what's the story, Detroit? I started out with a 1940 Ford, which I got right after the war in 1946. Then I inherited my dad's 1941 Ford. That lasted me until I started making some real money. Well, I worked as a radio engineer and TV director, and neither job paid enough so that I could get a new car. It wasn't until I started my own company that I was able to get a 1954 Ford Country Squire. Well, I went wild, of course, with a yacht, a seaplane, and an Arab horse. And that spiffy Country Squire. It was great, with only a couple dozen problems for the car dealer to fix after delivery.

All that changed in 1957, when Ken Grayson W2HDM, my surplus editor, introduced me to sports cars. I opted for a Porsche Speedster, the most exciting and fun car I've ever owned. I put on over 100,000 miles rallying with it, including some SCCA national rallies. I've got a carton of trophies out in the barn somewhere.

A few years ago I wanted to set up a small office in a van so that I could work while I was being driven to give talks to business groups and ham clubs. I settled on a Dodge van. Super bad move. It never did run dependably, despite the best efforts of the local Dodge dealer to fix it. What a turkey! It would run for about a half mile and then stall until I poured a little gas into the carburetor to get it going again.

When Toyota came out with their van I immediately bought one. It was a gem. After five years, I turned it in on a new Toyota Previa van. When the lease ran out on our second Previa, Toyota had discontinued that model and had nothing new that we wanted, so I got the used truck and made do with that.

It was the Honda van with the navigation system that got us back into vans. But it's fun to sit in a restaurant and open and close one of the van's side doors from my table, watching the reaction from the window. How about it, Detroit? What does it take to get through the seemingly brain-dead management?

Quicksilver

Mercury is one of the most toxic substances known. One drop will send you to the emergency room. A thimbleful will kill you. A half gram in a 10-acre lake warrants a fish advisory. In 1994, Minnesota banned running shoes with lights in their heels because the shoes contained a half gram of mercury.

The average amalgam "silver" filling contains a half gram of mercury. What's dangerous for a small lake is safe in your mouth?

Dentists are placing over 100 million amalgam fillings a year. The American Dental Association says they're safe, despite overwhelming medical evidence to the contrary. Like the tobacco and asbestos industries, they've been denying the dangers. And dentists who have had the courage to prove conclusively that amalgam fillings are causing serious illnesses have had their licenses taken away to shut them up.

The average person with amalgam fillings is breathing up to 29 micrograms of mercury a day. Chewing food, gum, grinding your teeth, and high acid foods can up that to 100 micrograms a day! In 1994, the U.S. Public Health Service said that anything over 0.28 micrograms of mercury vapor per day constituted a health risk from the vapor.

As I've mentioned before, 98% of the people with multiple

Continued on page 26

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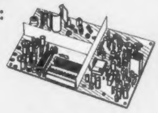

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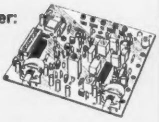

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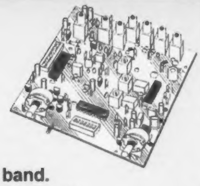

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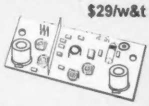

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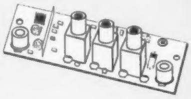

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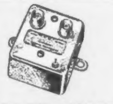

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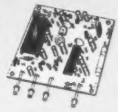

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Morse Code — The Once and Future Mode

Will you outlive it — or vice versa?

My grandmother was born in 1877. That means that I personally knew and spoke to a person who remembered the introduction of the electric light, the telephone, the automobile, and world war. She knew her grandmother, who was born in 1840, before the Civil War and before the invention of Morse code and the electric telegraph. I'm 50 years old, and I knew someone who knew someone who remembered the Civil War! The pace of change is so rapid now that we tend to forget that we're only a few generations removed from a very primitive lifestyle.

Man has been around for something like 25,000 years (depending on who you talk to, and their definition of man). We have documentary records, i.e., recorded history, going back perhaps 6,000 years, again depending on whom you talk to. But it is only in the last 150 years or so that we have been able to communicate with distant people at speeds faster than a runner, or a horseback rider, or someone on a boat. One hundred fifty years ago, communications beyond line-of-sight traveled at literally a walking pace.

What we think of as communications today was born with the electric telegraph, which in turn depended on Morse code. What Samuel F.B. Morse and the other pioneers of telegraphy could not know was the profoundness of the changes that would result from the telegraph. It wasn't just "the birth of communications," but a full-scale revolution in relationships between people who weren't in physical proximity. Warfare, commerce, politics, and everyday life were changed dramatically and permanently.

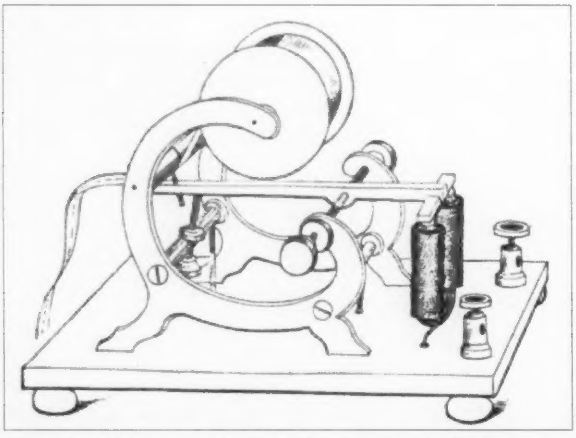

Photo A. *1850s pen register. During a dot or dash, the current through the coils creates a magnetic field that pulls the lever down, pressing a pen against the paper tape.*

In 1844, the only telegraph line was Morse's demonstration line between Baltimore and Washington, a distance of 40 miles. Six years later, according to the U.S. Census of 1850, there were already 12,000 miles of telegraph lines in use. By 1900, there were hundreds of thousands of miles of telegraph lines all over the world, connected in true networks that would be familiar to any student of the Internet.

There were tens of thousands of professional telegraphers. We forget how big a deal it was. And we also forget that the original wet-battery–powered telegraph networks evolved into the telephone system, the wireless radio networks, and even the broadcast media. All of those were gradual evolutions from the original electric telegraph. And at the heart of it all was Morse code.

Just as the original electric telegraph depended on Samuel Morse's code, so did the evolution of radio communications, and later digital communications. It sounds "clever" to say that Morse was the original digital mode, but it's literally true. Morse uses a simple "binary state" to store and carry information, and that is exactly what all those gigabytes of "ones and zeros" on your hard disks and DVDs are using.

What's more, if you want to, you can use any of the current means of communication to carry a message in Morse code. There is actually a large group of former (and aging) telegraphers who use the telephone system to hook up keys and sounders, keeping the art alive with the aid of Ma Bell. I believe they are working on ways to do it via the Internet even now.

Amateur radio operators were the pioneers of wireless telegraphy, and up to a point were the pioneers of most other forms of wireless communication. It is certainly true that code is no longer the defining element of amateur radio, but it is still useful, and fun, and for many of us the true heartbeat of the hobby.

A quick look at the code

What is Morse code, and how does it work? At its simplest level (and undoubtedly the way Morse intended it), it is just a set of dots and dashes or short tones and long tones used to represent the letters of the alphabet. But when it's working properly, that is, used by people who have "mastered" it, Morse code is a set of sensory cues, or signals, that are recognized instantly by the receiver. It is *not* a language, and it is nowhere near as difficult to learn as a language.

Human interaction is full of such sensory signals, using auditory, visual, and tactile "codes" that are understood instantly and instinctively. Morse is a little more elaborate, perhaps, in that it uses the sensory cue technique to represent an actual language (English or otherwise), and therefore can be used to communicate an infinite number of "messages." But let's look at some simpler sensory cues, which will give us an idea of why Morse works so well.

- Auditory cues. You hear a loud whistle, and you immediately know whether it is (a) an attention-getting whistle, such as that used to summon a taxi, or (b) a wolf whistle.
- Visual cues. A smile or a wink can convey volumes of information, none of which requires conscious thought. The same is true of more complex signals used by football and baseball coaches. The ultimate set of visual cues, and a close parallel to Morse, is sign language.
- Tactile cues. You're about to cross the street with someone, and they suddenly reach out and lightly press their hand on your arm. You don't think, you don't translate, you respond.

Recognition of such signals is a very primitive skill, which we all learn at a very early age. They are easily learned (and used) because in evolutionary terms they predate spoken and written languages. There are still many sounds we make that convey real meaning, but are almost impossible to write in words. We can say "the girl screamed" but we can't get the same message across with "the girl went, 'Aaarrrrrr-gggggg.'"

So, responding to intelligence embedded in auditory signals is a part of our basic skill set as human beings, and it should be no surprise that humans are for the most part very capable of learning Morse code to a point where it can be used without conscious thought. Perhaps it is just difficult to think about things that don't require thought, but in fact, old Samuel F.B. himself missed the boat, and is given more credit than is really due. Morse did not invent the process of copying code by ear — Nope, he designed the code to be written on paper and read by eye. It was wasn't long, though, before telegraphers realized that they could copy what was sent just by listening to the clicks of the pen register, and then it wasn't long before the pen was abandoned in favor of the sounder.

Morse code works with a very primitive part of our brain, and the result is that the technology used to support communication in Morse can be very, very simple. As simple as a flashing light, or a barely audible tone.

The superiority of CW as a mode for amateur radio communications

CW is the mode of communications most commonly used with Morse code. It may be unfashionable, but I think it is important to distinguish between the two. CW is a *mode*, and Morse is a *code*. Morse code can be

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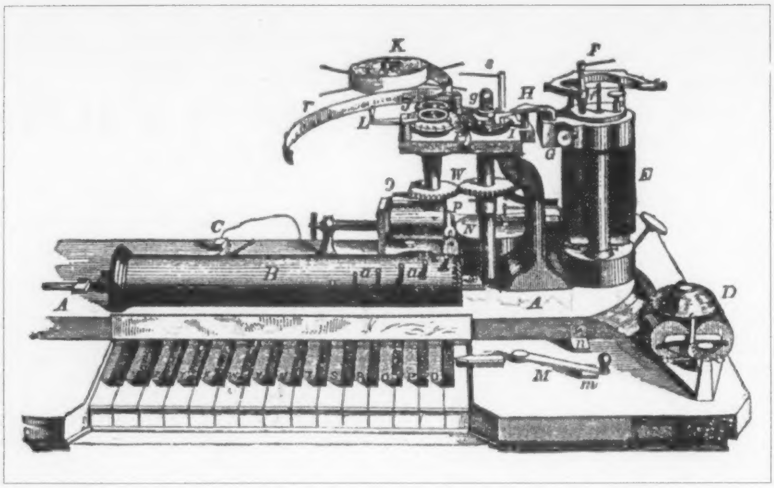

Photo B. *1860s printing telegraph. The "piano keys" are linked to the characters of the alphabet.*

used with flashlights, buzzers, sounders, and even FM radio, but none of those is CW. If we don't make the distinction, we can end up with newcomers making horrendous mistakes like "CW practice" using oscillators and FM transceivers in the CW part of the 2m band. Don't laugh — I've seen it done.

But I digress. We were talking about why CW is a superior mode. Just for the fun of it, let's imagine that the hobby of amateur radio doesn't exist, but the FCC has decided that it should be created as a hobby for ordinary citizens. We've been appointed to a committee to consider the options and recommend the best solution.

We start by defining our goal, which is simply to provide a means whereby two people (to be known as "hams") can communicate with each other over some considerable distance using radio waves. The two people may not know each other, and they may be on opposite sides of the globe.

Having defined our goal, we issue a "Request for Proposals" to interested corporations and groups in the "industry." Because it is a hobby, there isn't likely to be a lot of money to be made by the respondents, so we only get two proposals. Proposal Number One is from a giant corporation called Minisoft, and is titled "SSB 95/98/2000." Proposal Number Two is from the Earth Friendly QRP Club, and is titled simply "CW."

In responsible bureaucratic fashion, we list the advantages, disadvantages, and costs of each proposal side-by-side so that we can make a fair comparison. It's an interesting exercise, because almost all of the pluses are on the CW side of the page. We end up with about 300 pages of overheads, charts, and calculations, and so we try to boil it down to an "Executive Summary" that even our bosses will be able to understand …

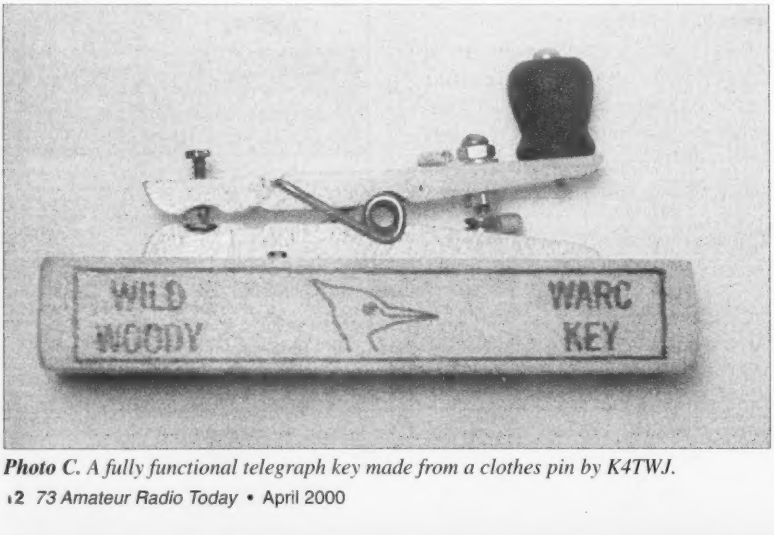

Photo C. *A fully functional telegraph key made from a clothes pin by K4TWJ.*

Executive Summary: The "CW" system is superior for amateur radio because the equipment is inexpensive and can be easily built by most prospective hams, a signal requires only a "point" frequency or very narrow bandwidth, and a comparable signal using the "SSB" system will require 18 dB more power output.

The only argument against the CW proposal is that to use the "CW" system, the "hams" would have to learn Morse code, while the "SSB" system requires only that the "hams" be capable of picking up a microphone and knowing when to push the button.

It is the conclusion of this committee that the "CW" system will empower far more "hams," at far lower cost, and with much more efficient usage of limited RF spectrum. But we're gonna recommend the "SSB" system because the Minisoft folks took us out to lunch and gave us a coffee mug.

Attempts to kill the code

Despite the usefulness of Morse code and CW, there have been two major thrusts to eliminate them in the "real world." The first is the abandonment of Morse for communications at sea. We should be able to surmise something about this from the fact that it was done by ukase. What happened was that a (or perhaps the) international maritime organization issued an edict that ships over 300 tonnes were not to carry Morse equipment, period. Those that had it were specifically directed to remove it.

That doesn't make much sense until you consider it in terms of money and politics. Mostly money, of course. I have heard from several maritime radio officers that the ship owners deeply resented having to pay a radio officer "just in case," when any other officer can pick can pick up a microphone and use a keyboard to communicate via satellite. How many lifeboats were on the *Titanic?*

Then there's the military, and guess what? We find money and politics at the root of it again. The U.S. military in particular has a preference for solving problems by throwing technology rather than manpower at them. And, of course, the military's preference is deliberately nurtured by the contractors, many of whom can only survive by selling new technology to the military.

The military being what it is, they take a heavy hand to things at times, and a side effect of all the new communications technology is that MARS stations were *ordered not to use CW.* Remember, these are essentially amateur radio stations cohabiting in military networks. They weren't given "newer and better" equipment, but ordered to throw away an existing capability!

In our "unreal world" of amateur radio, we have seen a lot of pressure to abandon the code as a licensing requirement. Usually it's sugar-coated, along the lines of, "Nobody is saying you can't use it, we're just saying you don't *have* to learn it." Why?

It doesn't take much analysis to come up with the answer: money and politics. For most of us as individuals, amateur radio is a hobby. But for far too many "support types," it is an industry. Manufacturers and bureaucracies are concerned that the market is "shrinking." They point to license numbers and say that the amateur population is declining, and getting older, and *something must be done.* Obviously, we need to make it easier to become a ham, and about all we can do apart from giving away licenses is to eliminate the code requirement.

But guess what, boys and girls. … We've been there and done that. We got a huge influx of no-code licensees in the '70s, but we didn't maintain their interest, and they are dropping out of the hobby like flies. *That* is the shrinkage that the industry is seeing. The popular wisdom now is that access to HF will bring them back and keep them in.

The important thing here is that in the three major areas of code use, it is being actively discouraged for reasons which have absolutely nothing to do with its usefulness.

Code today and tomorrow

This article wasn't intended as a defense of Morse code, which, after all is said and done, *needs* no defense. So let's get down to brass tacks. Literally. Take two brass tacks. Stick them into the end of a clothes pin, facing each other, so that you can click them together. Click them together in the familiar rhythm of Morse code, and

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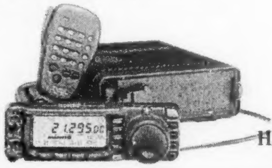
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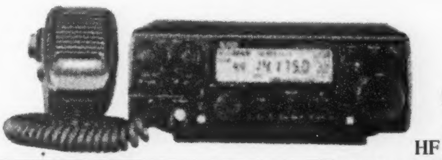
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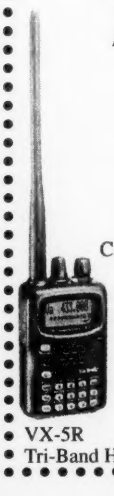
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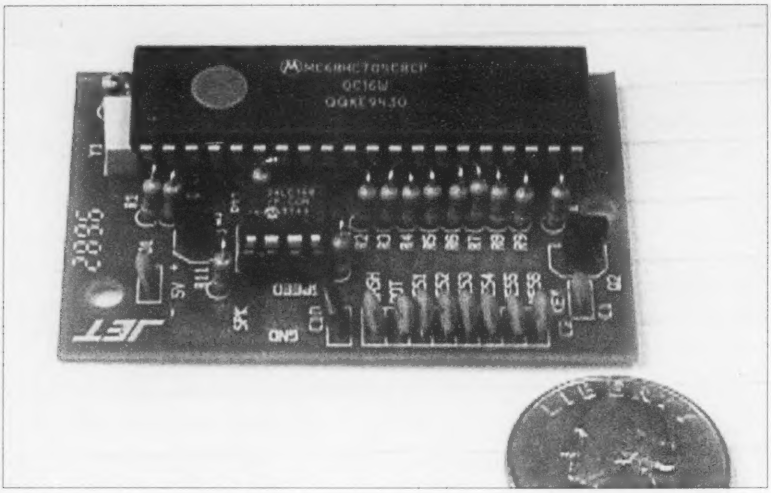

Photo D. *Modern "single chip" electronic memory keyer, with microprocessor control.*

someone on the other side of the room will be able to hear them and understand what you are saying.

Connect a wire to each of the tacks, and the other end of the two wires to a CW transmitter. Connect another, longer piece of wire to the transmitter, and now someone on the other side of the *world* can hear your little brass tacks clicking together and understand what you are saying — even if they don't speak English.

The CW transmitter is in essence so simple, so foolproof, that any amateur radio operator can build one, with parts from an old TV set or an inexpensive kit. Before you know it, you are having fun, and that's what hobbies are all about. Not only is it fun, but you can feel very proud of yourself because you are using equipment that you made yourself!

The range of equipment available for CW operation is huge, as you might expect after a hundred years or more of development. The simple Morse telegraph key is little different from the very earliest examples. But it is a tool, and as with all tools, there have been lots of refinements and artistic renderings.

Many telegraph keys are genuine works of art, including some made from or plated with silver, gold, and platinum, or even studded with jewels. As an indication of how pervasive Morse code and the telegraph culture were 70 years ago, the humble telegraph key was used as a motif for all sorts of other items, such as cigarette lighters, staplers, toys, and jewelry (even today, there is a variety of jewelry chain, with mixed short and long links, called a Morse code chain"). Over 50 different manufacturers of "toy telegraph sets" are known, and these sets actually worked.

The basic telegraph key is a simple switch, and there have been many different approaches to the same task from semi- or fully automatic mechanical keys (bugs), to electronic keyers and paddles. The current generation of electronic keyers is based on microprocessors that have more grunt than a mainframe computer did a scant 50 years ago.

I have the extremes pretty well covered in my shack. Most of the time, I use a very advanced memory keyer, with more features than I will ever use, driven by a fairly expensive paddle. But about a foot away from it, and connected, ready for use, is a simple straight key that I bought at a swap fest about a month before I got my first amateur radio license. I still use it from time to time, and not just on Straight Key Night. It's easier and more efficient to use the paddle and keyer, but the minute my hand touches the straight key, I am making a physical and metaphysical connection with my own past and with every telegrapher who ever went to sea, or pulled a Western Union shift, or sent a report from behind enemy lines.

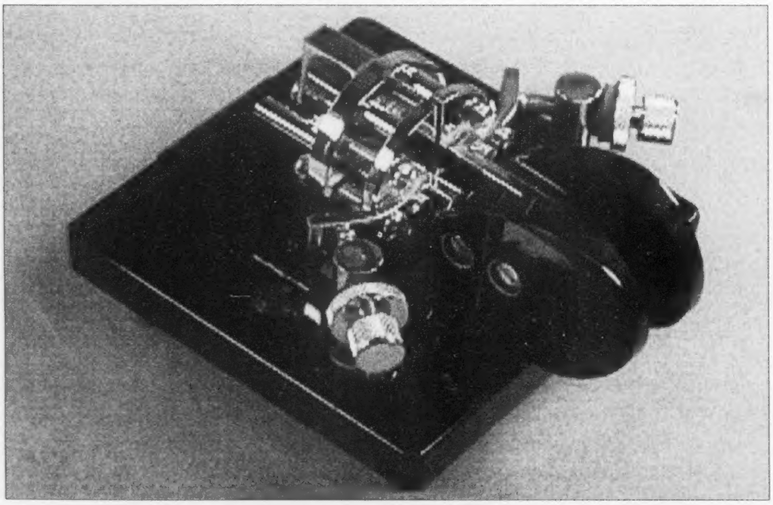

Photo E. *Modern high-speed dual paddle, by G4ZPY. The design is optimized for operation at up to 60 wpm.*

On learning the code

Using Morse code is a *skill*, like riding a bicycle, or playing golf. You have to learn how to do it, and you get better at doing it through practice. Riding a bicycle is a good analogy, because it seems impossible at first but eventually something "clicks" and you can do it. Not only can you do it, you wonder what all the fuss was about. In one respect, however, playing golf is a better analogy because it is *open ended.*

Continued on page 58

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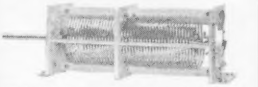

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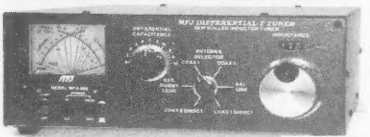

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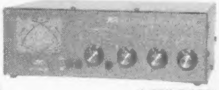

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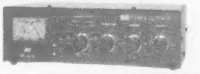

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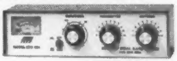

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CALENDAR EVENTS

Number 16 on your Feedback card

Listings are free of charge as space permits. Please send us your Calendar Event two months in advance of the issue you want it to appear in. For example, if you want it to appear in the July issue, we should receive it by April 30. Provide a clear, concise summary of the essential details about your Calendar Event.

APRIL 1

WATERFORD, CT The Radio Amateur Society of Norwich will hold their Ham Radio Auction at the Waterford Senior Center on Rt. 85. From Hartford, take Rt. 2 South to Rt. 11 to Rt. 85 South. From the shoreline, take Rt. 95 to Rt. 85 North. Talk-in on 146.730(-). Bring your gear to sell (10% commission to RASON). Free admission, free parking. *Contact Tony AA1JN at (860) 859-0162*, or see the RASON Web page at *[www.rason.org]*.

WEST ORANGE, NJ A Hamfest will be held Saturday, April 1st, 8:30 a.m.-1 p.m., sponsored by the Roseland Radio Club. For a good time, drive on over to West Orange High School, 600 Pleasant Valley Way in West Orange (Exit 7 off of Interstate Rt. 280). Talk-in on the W2QR rptr. system at 146.415(+) 85.4T; 224.480(-1.6); 447.875(-5.0) 156.7T; or 146.520 simplex. Contact *Jim Howe N2TDI, (973) 402-6066 or Liz Howe N2WGH, (973) 402-6066*. This event will appeal to amateur radio ops, computerists, SWLers, and electronic hobbyists. Plenty of free parking with ground level access. All indoors. Commercial vendors. VE exams by courtesy of Nutley ARC. Admission $5, at the door only. XYLs and children under 12 admitted free with regular admission. Tables $12 for the first and $9 for each additional or $15.00 for first and $12 each additional, at the door. $2 extra for electricity, reserve by March 15. Sellers admitted at 7 a.m. There is a special parking lot for vendors.

APRIL 9

HAMILTON TWP, NJ The Hamcomp 2000 Hamfest will be sponsored by the Delaware Valley Radio Assn., at Tall Cedars of Lebanon Picnic Grove on Sawmill Rd., in Hamilton Twp. I-95 North to I-295 South; Exit 60A to I-195 East; Exit 2 to Yardville; South Broad St. to end, approx. 3.7 miles; left at Yield onto Old York Rd.; next right onto Sawmill Rd.; the site is 1.1 miles on the right. Open to buyers at 8 a.m.; open to sellers at 6:30 a.m. Admission $6; non-ham spouses and children admitted free. Free parking. Tailgating space $10, includes one admission. Covered table space $15; includes one table and one admission. Advance covered space reservations are available. Some electricity. Talk-in on 146.67(-). Contact *Hamcomp 2000, DVRA, P.O. Box 7024, West Trenton NJ 08628; or call (609) 882-2240. Visit the club Web page at [www.slac.com/w2zq]*.

RALEIGH, NC The Raleigh ARS will present its 28th Hamfest, NCS ARRL Convention, and Computer Fair in the Jim Graham Bldg., NCS Fairgrounds, Sun. April 9th, 8 a.m.–4 p.m. Wheelchair access. Advance tickets $5, $6 at the door. All activities will be inside. Tables and booths are available. Free parking. RVs welcome. A hospitality party will be held Sat. night. VE exams *W4VFJ, (919) 556-8551*. Dealers, contact *Greg Miller W4IK, 9408 Hinshaw Rd., Wake Forest NC 27587; tel. (919) 528-6510*. Talk-in on 146.64/.04.

APRIL 14–15

BLAINE, MN The 19th annual Midwinter Madness Hobby Electronics Show will be held at the National Sports Center, north of Minneapolis/St. Paul on 35W, Exit 32. The Robbinsdale ARC is celebrating its 42nd year! VE exams Fri., April 14th. Exposition April 15th 7:30 a.m.–2:30 p.m. Super buys on computers, hardware, components, peripherals, and amateur radio equipment. Admission $7 at the door. Contact *RARC, 4737 S. Hwy. 101, PMB #276, Minnetonka MN 55345; or call (612) 537-1722. Internet [http://www.visi.com/~k0ltc]. E-mail [k0ltc@visi.com].*

APRIL 14–16

VISALIA, CA For over 50 years, the Southern and Northern California DX Clubs have alternately sponsored the annual International DX Convention in Visalia CA. The Year 2000 Convention will be sponsored by the Southern California DX Club (SCDXC), on April 14th, 15th, and 16th. For additional info check the Web site at [http://www.scdxc.org/dxconv 2000.html]. The pre-registration deadline is March 15th. $60 before the deadline, $65 after. Contact *Don Bostrom at (818) 784-2590* for more info. Your reservation fee includes the following: A hosted cocktail party; all HF, Low-band and DX-oriented forums and technical sessions; the Traditional Conventions Patch; the Saturday Night Banquet and DX oriented programs, featuring a well-known speaker; and the Sunday morning breakfast buffet with well-known guest speakers. For hotel info call *1-800-524-0303 or the Internet at [www.cvbvisalia.com]*.

APRIL 16

SHAKOPEE, MN Smartsfest 2000 will be held April 16th, 12 noon–5 p.m., at Canterbury Park in Shakopee. Vendor setup starts at 8 a.m. VE exams start at 10 a.m. Remember to bring your CSCEs for your new upgrade. Flea market tables $10. Admission $4 in advance, $5 at the door. Talk-in on 147.165(+). For more info write to *SMARTS, PO Box 144, Chaska MN 55318.*

APRIL 29

SONOMA, CA The Valley of the Moon ARC, W6AJF, will hold its annual ARRL Hamfest Sat., April 29th, 8 a.m.–Noon at the Sonoma Valley Veteran's Memorial Bldg., 126 First Street West, Sonoma. Admission is free. Registration starts at 9 a.m. for a walk-in VE exam session. Testing for all license elements begins at 10 a.m. There will be an electronics swap meet with both indoor and outdoor spaces available. Setup will start at 7 a.m. Spaces $10 each. The club will serve a full breakfast 8 a.m.–10 a.m., including eggs, pancakes, sausage, juice and coffee or tea for $5. A pancake-only breakfast will be $3.50. Forums will include an operating QRP station, display of homebuilt equipment, and a beginner's RDF hunt. VOMARC will participate in the QRP To The Field contest which will run during the hamfest. Guest operators are cordially invited to sit in and take a turn operating the club station. For a map and printed directions to the hamfest, send a business size SASE to *VOMARC, 358 Patten St., Sonoma CA 95476*. Talk-in will be on 145.35(-600), with a PL of 88.5. For more info call *Darrel WD6BOR at (707) 996-4494*.

STICKNEY, IL DuPage ARC's Hamfest and Computer Show will be held 8 a.m.–2 p.m. April 29th, at the Hawthorne Race Course, 3500 South Cicero Ave., Stickney IL. Tickets are $5 in advance and $6 at the door. Send a check payable to DARC and enclose a #10 SASE. Mail it to *DARC Hamfest '00, 7511 Walnut Ave., Woodridge IL 60517-2818;* (must be received by March 30th). Children under 12 years old admitted free. Commercial dealers can set up indoors Fri., 3 p.m.–6 p.m. Commercial and flea market vendors can set up on Sat. after 6 a.m. VE exams, all classes, 9 a.m.–Noon. Walk-ins welcome. Free parking. For table availability and more info call *(630) 985-9256*. Talk-in on 145.25. No overnight parking or camping. *E-mail [DARChamfest@aol.com]. The Web site is [WWW.W9DUP.ORG].*

APRIL 30

ARTHUR, IL The Moultrie AR Klub will hold their 38th Annual Hamfest, 8 a.m.–1 p.m., at the Moultrie/Douglas County Fair Grounds on the south side of Arthur IL. Talk-in will be on 146.055/.655 and 449.275/444.275. Admission is $5 per person over the age of 14 years. Tables $10 each, paid in advance. For info or table reservations, write to *M.A.R.K. P.O. Box 91, Lovington IL 61937. Or call (217) 543-2178 days; (217) 873-5287 nights.*

MAY 6

CEDARBURG, WI The Ozaukee Radio Club will sponsor its 22nd Annual Cedarburg Swapfest, 8 a.m.–1 p.m. at the Circle-B Rec. Center, Highway 60 and County I (located 20 miles north of Milwaukee, west of Grafton). Admission $4, both in advance and at the door. 4-ft. tables are $5 (limited power on request). Seller's setup at 6:30 a.m. VE exams start at 9 a.m. Talk-in on 146.37/.97 and 146.52. For tickets, table reservations, maps or more info, send an SASE to *Joe Holly, ORC Swapfest Chairman, 1702 Holly Lane, Grafton WI 53024. Tel. (262) 377-2137.*

SILOAM SPRINGS, AR The Siloam Springs ARC Hamfest and Flea Market will take place at St. Mary's Catholic Church at 1996 Hwy. 412 East in Siloam Springs AR. Hours are 8 a.m.–3 p.m. Talk-in on 146.67. Computer seminars will be held during the hamfest. Contact *Matt Hyde N5UYK at (501) 524-4797.*

OWEGO, NY The Binghamton ARA will host the 2000 Owego Hamfest, May 6th, starting at 8 a.m., at Tioga County's Marvin Park Fairgrounds. Setup for vendors and tailgaters at 6 a.m. Indoor vendors who require Friday setup, call ahead of time. Admission $5. Tailgate spots $2. Indoor tables $10 ea. VE exams will be conducted in a quiet setting at the school next door. For more info, or to reserve an inside table, *E-mail [rmess@binghamton.edu]; or call Bill Coleman N2BC, (607) 748-5232; or write to BARA, P.O. Box 853, Binghamton NY 13902-0853.*

MAY 6–7

ABILENE, TX The Key City ARC will sponsor their 15th annual Hamfest at the Abilene Civic Center from 8 a.m.–5 p.m. Sat., May 6th, and from 9 a.m.–2 p.m. Sun., May 7th. Free parking. VE exams. Wheelchair access. Limited RV parking for a nominal fee. Tables $6 each. Pre-registration $7 (must be received by May 1st), $8 at the door. Talk-in on 146.160/.760. For reservations and info contact *Peg Richard KA4UPA, 1442 Lakeside Dr., Abilene TX 79602; tel. (915) 672-8889. E-mail [ka4upa@arrl.net].*

MAY 7

HAGERSTOWN, MD The Antietam Radio Assn., Inc.'s 8th Annual Great Hagerstown Hamfest & Computer Show "The Millennium Hamfest" will be held at Hagerstown Community College Rec. Center. From Interstate 70, take Exit 32B to Edgewood Dr. (Home Federal bank on right). Turn right. Drive 1.4 miles. Entrance to the college is on the left. Follow signs. From the north or south, take Interstate 81 to Interstate 70 East. Follow directions as above. Talk-in on 146.94 and 147.09 rptrs (W3CWC). Gates open at 6 a.m., building opens at 8 a.m. General admission $5, children 12 and under free. Tailgating is an additional $5 per space on an asphalt tailgate area. New and used computers and supplies, and ham radios will be the featured items. VE exams by the ARRL VEC Team, on the 2nd floor of the Rec. Center. Walk-ins OK at 8:30 a.m. For more info contact *Greg Lanham WA4VE, (540) 772-4792. E-mail [kuan@visuallink.com].* There will be an ARRL forum at 10 a.m., and an ATV forum at 11 a.m.

SPECIAL EVENTS, ETC.

APRIL 8–9

GREEN VALLEY, AZ The Green Valley ARC will conduct their 9th annual commemoration of the closing of all Titan 2 missile sites by operating N7GV from 1800Z April 8th to 2100Z April 9th. Frequencies are: 7.272, 14.272, 21.372 and 28.372. A certificate is available. Send requests to *GVARC, 601 N. La Canada, Green Valley AZ 85614.*

APRIL 15

AMES, IA The Cyclone ARC of Iowa State University will operate W0YI on April 15th, from 13:00 to 23:00 UTC, in conjunction with Iowa State University's VEISHEA 2000 Celebration. Frequencies will be 7.240, 14.240, 21.325, and 147.375. QSL cards available. Send request to *Cyclone ARC, Iowa State University, Friley Hall Box 7275, Ames IA 50012.*

APRIL 30

STERLING HEIGHTS, MI Special Event Station W8A will be operated by the Utica Shelby Emergency Communications Assn., for the March of Dimes Walk America on April 30th. Operation will be on the General portion of the 20 and 40 meter bands and the Novice/Tech portion of the 10 meter band. The station will be on the air 1100Z to 1700Z. U.S.E.C.A. will acknowledge contacts with either a postcard QSL or an 8.5- x 11-inch certificate to all verified stations that send an SASE to U.S.E.C.A., P.O. Box 1222, Sterling Heights MI 48311-1222. For more details and updates on this event, visit the Web site *[www.useca.org].*

MAY 5–7

MARTHA'S VINEYARD ISLAND, MA The Fall River ARC will operate W1ACT portable from the Gay Head Lighthouse on Martha's Vineyard (IOTA NA-046). Frequencies: 14.260, 21.260, 28.460 and 146.55 MHz. Operation will start May 5th at 18:00 UTC and end May 7th at 21:00 UTC. Please QSL SASE via *N1JOY.*

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The Long-Lost Art of Conversational CW

Banging away for long chats can be fun — if you know what to say.

Probably one of the best and most interesting parts of the ham radio hobby is meeting and making new friends over the air. Yes, with the advent of E-mail, this can be done with the aid of a computer and modem. However, typing out messages on a computer keyboard doesn't have the "feel" of live, on-line communications.

Besides, with ham radio we are talking to fellow hams. These are hams who have gone through the learning and licensing process we all had to pass through. This unique "trial by fire" gives us a common bonding, one where we can relate to each other from the very first "Hello, my name is… ."

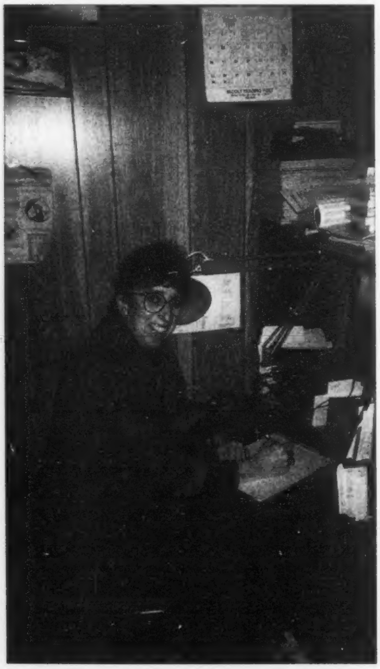

Photo A. *Marsha Messer AB7RJ, of Yacolt WA, works Morse code from her home station.*

As Novices, we were taught to begin our QSOs with the old tried-and-true format. We would give our callsign, RST, the all-important QTH, the description and power output of our rig, antenna type and height, and our name. The all-too-common ending with a "Thanks for the contact, see you down the log," always seemed like a waste. Sure, a logbook entry was made and perhaps qualifications for an award were met, but to me, an opportunity was lost to make a friend. Well, maybe we weren't going to make a friend every time, but it was a missed chance to exchange some pleasantries or learn something about the other hams we meet on the air.

To me, everyone is interesting. They all have life stories, and most are willing to share bits and pieces of them with us. In keeping with the Novice format, there were other topic expansions such as, "I have been a ham since … ." Also, another good lead in was the old "My occupation is … ." With these openers, a QSO can be turned into an interesting learning experience. Having served in the U.S. Navy for many years, I find that contacts with former service members leads to some interesting "sea stories." The old "Where were you during such and such a time period?" leads to some "It's a small world" exchanges.

Ask questions

Once you've made a contact with someone who seems willing to linger longer than an exchange of data, try to hang on a few minutes with some follow-up questions. I usually make a note or two as the QSO progresses. I leave a wide margin on the right-hand side of the note paper I use to copy my CW. If their QTH is interesting or near a place I would like to know something about, I ask for details. If their occupation interests me, I ask about that. I usually ask about their hobbies — other than ham radio. Children? Grandchildren? Most of us like to talk about our kids and their successes. Once you get the ball rolling, the rest is easy.

QSO in progress

Once off to a good start, your QSO will keep you going with the new information gained from the answers to your questions. Just this moment I heard a station in Colorado breaking into a net asking for a signal check on a new amplifier he had restored. While I wrote, I overheard him mention that he had operated maritime mobile for many years. I quickly broke in and asked him what his experiences were in maritime mobile, one of my favorite topics. He came back with some great stories about sailing in the Atlantic aboard a small sailboat (his idea of small was 50 feet!). While the contact was brief and on SSB, I use this as an example of grabbing onto an interesting topic and exploring it. Granted, on CW this "exploring" takes a bit longer than on voice, but the principle is the same. Anything that arouses the interest of either party is grist for the CW mill. Once a common topic of interest is reached, jump right on it with gusto.

Making good friends

Years ago, when I was a Novice, I resolved to work stations "far away." I operated on the 40 meter band at all hours of the day and night, copying weak signals. One night at about 2200, I picked up a station that was almost inaudible. A ham in a remote corner of northwest Arkansas was banging out a steady "CQ." At my then-speed of about 5 words per minute, I responded. His code was perfectly readable, slow but methodical, and without errors. Hmm … this could be fun. And it was. The fellow on the receiving end of my RF was a former Army radioman who had retired to the center of the United States to relax, fish, and enjoy what beauty nature had to offer. Knowing little about his state, I plied him with questions. He replied with some historical data. He was from Caddo Gap, not far from where early French explorers had traveled. I was getting a history and geography lesson at the same time!

He was a Novice like me, but when he mentioned that he knew some of the older movie stars of the '30s and '40s I was fascinated. Yes, he had swum in the ocean with Ozzie and Harriet Nelson when they were working together in music. We talked of the other Hollywood personalities he had worked and played with.

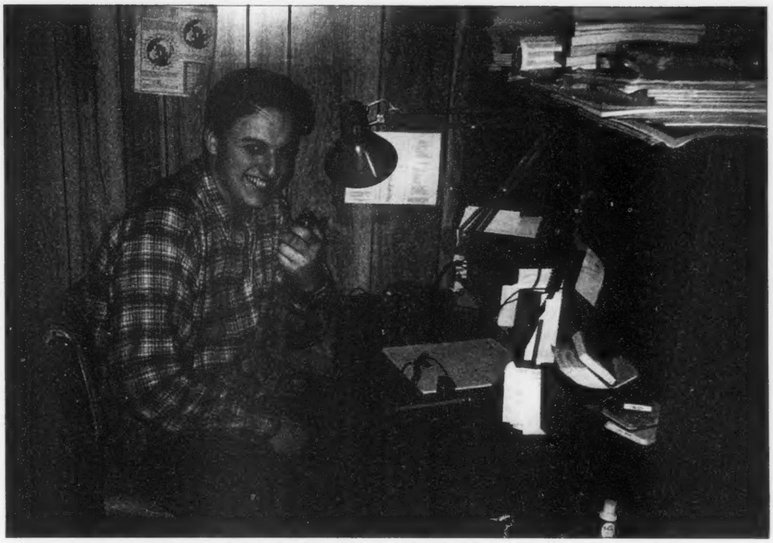

Photo B. *Brad Messer KC7KTL shares the same rig.*

His code speed kept pace with mine. First at 5 wpm, then 8, then 10. I marveled at the overall progress we were making in our code speed. One night just before our schedule, I heard code at about 30 wpm. Then there was a break for a callsign. It was my friend, conversing with other CW pals! I thought he was working at his max speed with me! Not so. He was merely helping me along. The operator was Rod Lowe KA5NIM, and we became lifelong friends. When my wife (Donna AB6XJ) and I traveled cross-country with our trailer, we purposefully detoured a few miles to "stop by for a cup of coffee" with Rod. We worked CW every night until we arrived and parked in his front yard. He and his wife had dinner on the table for us when we got there. They wouldn't let us leave until three days and nights had passed.

Another good friendship I've made, with the Messer family in Washington state, was documented in these pages in the January 1998 issue ("Marsha and Me: Making friends via hamming.").

CW contacts fun? You bet!

Most hams have led interesting lives. Even an eight-year-old ham can be interesting. How did they get to be hams? Where do they live? What influence has their parents played in their lives? Once you get them to talking about the life experiences they have had, QSOs get interesting. In Marsha Messer's words, "Most new hams are nervous when using code. I understand that. When I first started out with CW, I was still trying to form words into sentences, and I had to work hard at it. Now, it's easy. I know that lurking inside every new or nervous ham is a rag-chewer just waiting to be let out of the box to have fun. It may just take a little time and urging from us until another full-blown rag-chewer is born." 73

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Then drop them off at your local school(s).

Morse code is fun. It is a universal language based on a combination of short and long sounds or blinking lights. It can be learned, mostly with practice, in a short time.

Morse code goes back over 150 years, when it was invented by Samuel F.B. Morse 1791–1872. He sent the message "What hath God wrought?" over the first telegraph line from Baltimore MD to Washington DC. His "language" gained worldwide acceptance. Even though more sophisticated modes of communication exist today, thousands of amateur radio enthusiasts ("hams") use the code with simple radio equipment and antennas to communicate across the state and across the globe.

One fun way to learn the code is for two friends to take turns sending the code back and forth to each other. A simple buzzer can be easily constructed with readily available parts for a few dollars (see photo and drawing). The buzzer (No. 273-065) and a 9 volt battery can be purchased at Radio shack. If you do not have a key, or know someone who can lend you one, a simple one can be made. As you can see in the photo, you will need three pieces of aluminum or tin. Just be careful not to cut yourself on the sharp edges. The knob can be half of a sewing thread spool, which can be fastened to the metal arm with a nut and bolt.

Everything will fit on a piece of scrap wood about 8 by 10 inches. Just about any kind of wire, like bell wire, can be used to connect the parts together. Make sure you scrape the insulation off the wire where it connects to the screws or the buzzer. When finished, you have a complete circuit. By moving the key up and down, you open and close the circuit and make the buzzer buzz.

Dits are very short, and a dash is three times as long as a dit. Don't try to count the dits and dashes as they are

Continued on page 58

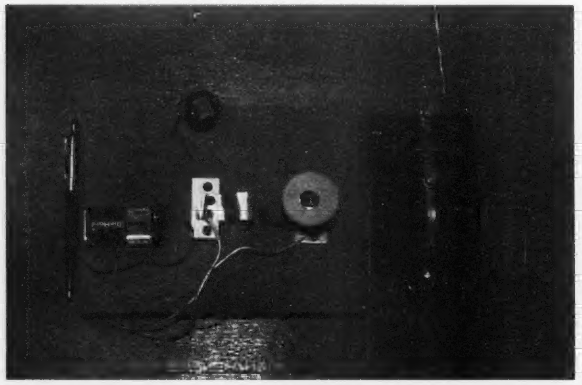


Photo A. *Your code buzzer is all finished and ready for fun.*

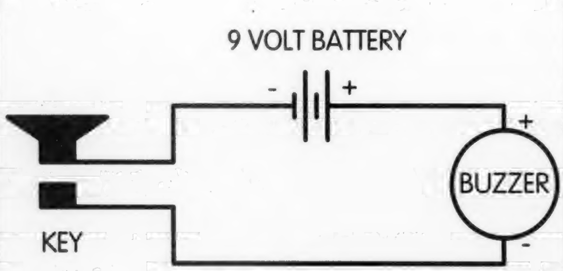


Fig. 1. *Wiring diagram for the Morse code buzzer.*

Jeff M. Gold AC4HF
1751 Dry Creek Rd.
Cookeville TN 38501

More on Embedded TICKs

Here's an update on those tiny CMOS keyers.

What's very small (1" x 1"), inexpensive, easy to build, and can be used as a code practice oscillator or a Morse keyer? The answer is the TICK series of tiny CMOS keyers from Embedded Research.

The kit I built is called the TICK-1. The 8-pin CMOS chip that controls this keyer sells for $5, and the complete kit is $16. I built the kit. The kit comes with the board and all board-mounted components, as well as the two jacks for the paddles and rig connect, and the push-button for keyer control. This keyer chip is one of a series of five available keyer chips or kits from Embedded Research (PO Box 92492, Rochester NY 14692; E-mail: [embres @vivanet.com]; site: [www.vivanet.com/~emres]).

I started in ham radio not all that long ago, or so it seems. I have always enjoyed CW operation. My first keyer kits cost me in the neighborhood of $50. The keyer did not have many features and was fairly large. Newer technology is always getting smaller and cheaper, which means we get to play more for less money. This keyer board is small enough to put into many interesting keyer/paddle/rig combinations. I have put the keyer into a computer mouse. I was able to fit the keyer and a battery in the mouse-paddle. I ended up with a small and rugged and very inexpensive paddle/keyer arrangement. I have also managed to build a complete dual paddle arrangement in a small Altoids box. The paddles work very well; I have taken the setup on many portable operations and made numerous contacts with it.

The TICK-1 kit took me about 30 minutes of slow and easy building. The TICK-1 includes iambic Mode A/B, speed adjust, a tune mode, a selection to allow which paddle is dit or dash, and a manual key mode. There were a

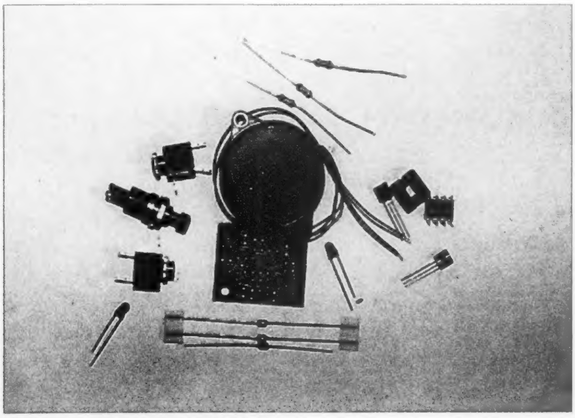


Photo A. *Unassembled TICK kit.*

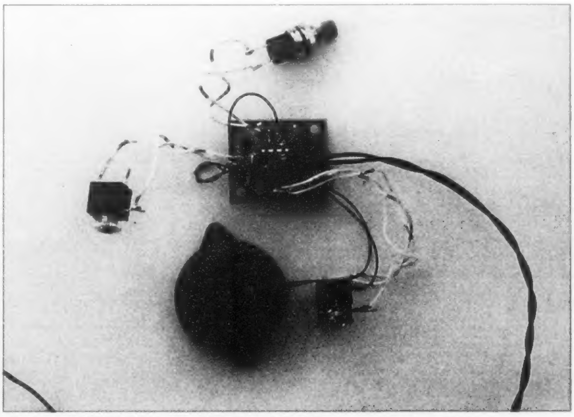
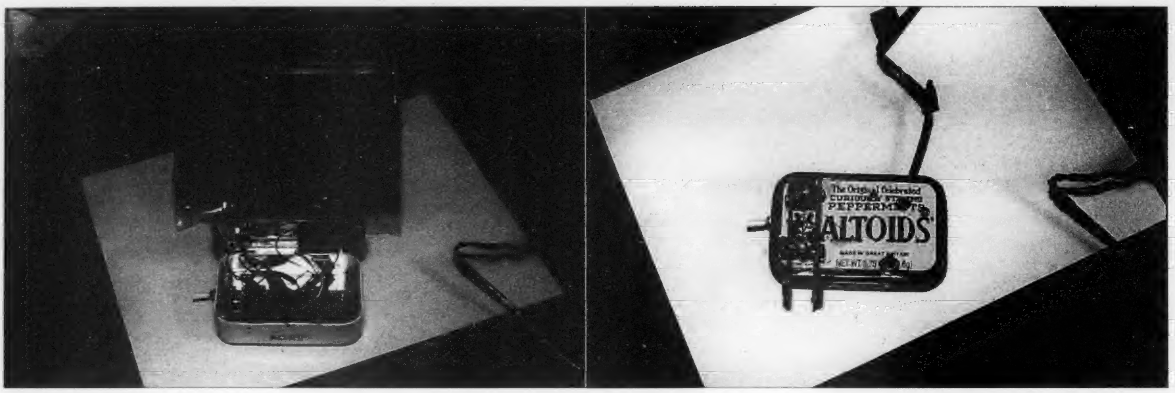


Photo B. *TICK kit put together.*



Photos C. TICK in your can.

total of seven board-mounted parts in the configuration I built. Aside from the simple board arrangement, you wire up the paddle jack, the keyline to your rig, and the push-button.

During the building process, you get to choose whether you want to build the kit to run on a regulated 3-5 volt source or a 12 volt source. I chose the 12 volt source because of the supply I use for testing kits, which sits right next to my workbench. The parts are included for either arrangement.

The next choice is what you would prefer to use for audio feedback/sidetone. I chose to use the piezo method. This is the simplest way, and a nice piezo speaker is included with the kit. You can use this as a nice code practice oscillator in this configuration.

Due to the simplicity of the kit, there are not many building steps. The directions are straightforward and very easy to follow. I did find a minor error that did not cause me any problems. In step 8 of the directions, it refers to the keyline jack as J2, and the picture under the step labels it as J2. In the parts list, on the circuit board, and in step 8d, the part is referred J3. The jack is also listed as J3 in the parts list. J2 is labeled on the circuit board as the 12 V input.

I would suggest using a low power, fine-tipped soldering iron. I used my old, faithful, cheap Radio Shack iron. I have been hinting to the family for a couple of years about a soldering station, but they are always looking for

Continued on page 59

Action	TICK Response (in Morse code)	Function
Press button	S	Speed adjust: press dit to decrease, dah to increase.
Hold button down	T	Tune: puts rig in transmit, press either paddle or push-button to unkey.
Hold button down	P	Paddle: press paddle that you want to be dit.
Hold button down	A	Audio: press dit to enable sidetone, dah to disable. Default enabled.
Hold button down	SK	Straight key: pressing either paddle toggles between straight key/keyer. Default keyer.
Hold button down	M	Mode: pressing the DIT paddle for iambic A, dah for iambic mode B (default).
Hold button down	K	Keyer: if push-button is released, keyer returns to normal operation.

***Table 1.** This table explains the TICK-1 functions.*

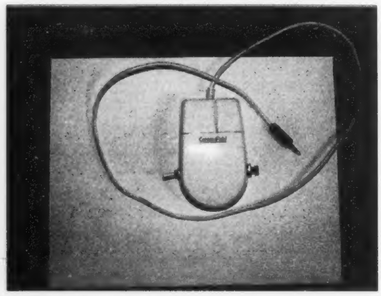


***Photo D.** TICK in your mouse.*

Model	Features
TICK-1 (Chip $5, Kit $16)	Iambic mode A/B, speed adjust, tune, sidetone, paddle select, manual key
TICK-2 (Chip $10, Kit $21)	All TICK-1 plus 25-character memory
TICK-2B (Chip $12.50, Kit $23)	All TICK-2 plus beacon mode and easier memory playback
TICK-3 (Super TICK) (Chip $15, Kit $25)	All TICK-2B plus two 50-character message memories
TICK-4 (Chip $15, Kit $25) (Enclosure $15)	All TICK-3 plus nonvolatile operating parameter storage (mode, speed, sidetone, keyer/beacon/straight key mode)

***Table 2.** Summary of features.*

Guy Slaughter K9AZG
753 W. Elizabeth Drive
Crown Point IN 46307
[guywrite@aol.com]

The Finger

Here's a positive way to respond when someone gives it to you.

I was reading the mail on the 2-meter repeater, half-asleep at the operating table of my basement shack Saturday night, when I heard the doorbell chime upstairs. Moments later, the three officers of the Hunky Hollow Work 'Em All DX & BS Society came trooping down the steps, presumably sent by Stella, my XYL. A problem was about to be solved.

I swung around in my swivel chair to greet them. They all looked sour. I scanned my memory bank, wondering if I'd done something to offend them, like working a rare one without alerting them to share it. Nothing came to mind.

"Hi, Guys," I said, not getting up. I cut the audio from the 2-meter set. "Sit you down." They did, all three parking on the sofa against the wall, Solly on my left, Cholly in the middle, Wib on my right. "Take your wraps off and tell me what's happening."

Nobody moved to shed coats or hats. They just sat there, silent, staring at me as though I were the bad banker who'd repossessed their rigs.

"Okay," I said, after a while. "Let's have it."

Cholly nodded. "We got trouble, Duke, and you gotta do somethin'."

"Whoa," I said, managing my friendliest smile. "You guys run the club. You're the president, Cholly. Whatever the trouble, YOU solve it."

All three started their heads shaking in unison from side to side and kept them waggling like a row of those spring-necked doggies you see in car windows.

Wib spoke up. "Nuh-unh. We already voted before we came over. He's your friend and it's your rig, so you gotta do it."

"Aha," I said, putting the blocks together. "Are we talking about Uncle Elmer?"

"You can't get on without he's layin' there waitin' for you," Cholly said.

"Right,". Wib chimed in. "You can listen around for hours without tipping your hand, and the minute you QRL or CQ, or call anybody, he's on you, covering any other signals, sending almost unreadable CW at maybe five words a minute, and long-winded."

"Poor old guy's got a problem with arthritis," I explained. "His hands are so gnarled up he can't handle the Vibroplex anymore. All he can do is punch at a straight key with one finger."

"So why's he bother?" Solly demanded. "Whyn't he just listen around and read the mail and quit tryna work guys when he can't cut it no more?"

"Whoa up, you birds," I said, feeling my blood pressure soar. "Remember who you're talking about. This man's been rag-chewing on forty meters since before you were born. He taught me what I know and he brought maybe half the other locals into ham radio. Why do you think we call him Uncle Elmer? He's a little older now, but he's still sharp mentally, he still loves hamming, he's got nothing else to do, and if anybody deserves a bit of care and feeding in his declining years, he does."

"You been on lately?" Cholly demanded. "You had him grab you and won't leggo?"

"No," I admitted. "I haven't had much operating time the last month or so. We're breaking in a new publisher at the newspaper and you know how it is when your work gets …"

"Fire up the rig," Solly interrupted. "Now. Anywheres on the low end of forty. Anywheres."

I shrugged, mystified. "Okay." I swung my swivel chair around, flipped the main switch, eyed the readout on the HF transceiver. "Seven-oh-four-oh okay?"

"Good as any," Cholly said.

The three men got off the sofa, still wearing their hats and coats, and walked over to stand behind me. I switched on the HF gear. A little clatter of QRN came from the station speaker.

"Say something," Wib directed.

Continued on page 24

The Finger

continued from page 23

I fingered the keyer paddle, sent QRL? QRL?, and signed.

Instantly a signal rattled the speaker cone. It was calling me at 10 decibels over S9 at maybe four words a minute and messing up half the characters. It was Uncle Elmer. When he signed, I sent his call, mine, then launched the sometimes phony, sometimes sincere string of comments you use to greet an old and dear friend or a new and unknown contact:

Ge om es tu for the fb call BT am vy psed to cu es so hpy fer the contact BT hpe all wl at ur house BT hr ur fb sig is 599 5nn wid no problems es fb cpy BT hw nw? AR

Signing, I sat back and listened to the pathetic fist of the old man trying to talk to me. My eyes misted over as I visualized Uncle Elmer prodding the ancient hand key with a right index finger, remembering what a consummate op he'd been until arthritis crept down his arms to cripple his hands and then, a year ago, the mini-stroke lamed up his legs. Now it took him five minutes to say, shakily and almost indecipherably:

Hi kid abt time you showed up BT where you been? BT the band ain't what it used to be BT guys dont like to ragchew much any more BT specially not wid a slow es crummy op like me BT can't blame em but nobody to talk to BT lots of contests only all at 40 per so I can't get in BT u okay? BK

I acknowledged with a string of Rs, assured him I was fine, told him that Stella had asked me about him that very morning (she hadn't), made small talk for another few minutes, let him rant on in very low-speed and very-messed-up Morse for another transmission, then said I had to run but would be looking for him again tomorrow.

"Ain't he a pain?" Cholly demanded, when I swung my chair around to face my three visitors standing side by side and ogling me grimly.

"No," I said. "Uncle Elmer is not a pain!" I sighed, hating to admit it. "But working him is pretty painful."

"Ha!" Wib shouted. He took a step toward me, leaned over to shake a finger in my face. "You think working him once is painful? Let me tell you painful! Three, four times a day every day is painful. Ever since you gave him your old rig and got him back on the air, it's three, four times a day you have to come back when he hears you on and calls you, snailing along at maybe five words per and covering anybody else who might be calling you and can't read half his copy. THAT's painful!" He stepped back into the line.

My three fellow officers of the Hunky-Hollow Work 'Em All DX & BS Society, still dressed for a winter storm, went to car-window doggying again, this time their heads bobbing up and down in vigorous and simultaneous assent.

I realized I was nodding in reluctant concurrence, even though it was Uncle Elmer we were talking about.

"Guys," I said. "You're absolutely right. But it's shameful. And we have to do something ..."

"Nuh-unh," Cholly interrupted me. The three heads stopped nodding. The three sets of eyes bored into mine. "Not we. You!"

They turned on their respective heels and headed for the stairway up and out.

"Thanks a lot, fellows," I said.

They didn't answer.

***

Sunday afternoon, I found Uncle Elmer in his wheelchair parked in front of the desk bearing the old Kenwood TS-830S I'd set up for him in this second-floor bedroom of his son's house across town from my QTH.

He was scanning the low end of 40 meters when I walked into the room, cranking the tuning knob first clockwise then counterclockwise with the forefinger of his right hand. Green numbers counted up and down on the display as fragmentary signals and an occasional burst of static sounded from the speaker.

"What's happening, Uncle Elmer?" I asked, stepping up behind him and patting his shoulders.

He turned his head, grinned up at me, said, "Oh, hi, Duke. Want some coffee?"

"Not a thing, thanks." I went to the bed along the far wall and sat down on it. "Rig working okay? Signal sounded good last night."

"Sure." Uncle Elmer dropped his eyes from mine. "And that dipole you hung in the trees, too. I get out fine. That's not the problem."

I decided to play dumb. "There's a problem?"

"Of course. The problem is I'm a lid and nobody wants to work a lid."

"You a lid?" I said, contriving to sound incredulous. "The world's best operator? The ham with more trophies and plaques and certificates and awards than Hiram Percy Maxim himself? What are you talking about?"

Uncle Elmer speared my eyes with his. "I'm talking about an eighty-two-year-old ex-op who can't finger a bug or squeeze a paddle or even stroke a hand key anymore. I'm talking about a has-been who wishes the world would talk to him, but realizes its people have other priorities."

I blinked. I said, "That's baloney."

"It's not baloney. I sit up here with nothing to do, trying to wish things back the way they were. Well, life doesn't do reverses for you. That's the way it is. So I don't bother strangers by calling them. I wouldn't expect them to come back to a crippled old fart sending error-filled CW at four words a minute. And my few friends don't need that kind of nuisance, either."

"You're talking nonsense," I said, wanting desperately to reassure him and to convince myself that things were going to be better. I looked at his operating desk for inspiration. I saw none. Beside the Kenwood there was a pad of paper and two wooden pencils, a dime-store pencil sharpener, an ancient Allied Radio logbook, a box of tissues, a coffee cup, and an old brass hand key screwed to the desktop. I said, "I'm ... working on something."

"Like what?" he demanded.

"Like turn off the vox gain so the rig's finals don't key and let me hear your fist."

"It isn't a fist." He tried to smile, didn't quite make it. "What God's given me is the finger." He held up his right hand for my inspection. The forefinger was sticking out, bent a bit. The other fingers and the thumb curled into a gnarled and twisted fist.

"So finger me a string of Morse with it."

He turned off the vox gain and began poking the key knob with his fingertip. The rhythm and the timing of the sidetone blips and bleeps from the speaker were terrible. Some of the dots and dashes were too short, some too long. It was not good CW.

After a while he stopped. Banging his twisted hand against the desk top in obvious frustration, he shouted, "I'm a lid, a dang ham-handed, clutter-fisted LID!"

I stood up. I said, "Stop it." I said, "Listen, Uncle Elmer, you quit that kind of thinking. What we have here is a small and temporary problem that we're going to fix." I walked out to head for home.

I was halfway down the stairs when I heard his shouted question. "How are we going to do that?"

I didn't answer, because I didn't know.

***

It was Saturday night again. I was in the basement shack again, but waiting, not interested in reading the mail. I heard the doorbell chime upstairs and directly the three officers of the Hunky Hollow Work 'Em All DX & BS Society were trooping down the steps again.

This time I stood up to greet them.

"Hi, guys," I said. "Take off your wraps. Solly and Wib, sit you down on the sofa. Cholly, you take the operator's chair. You're going to be working the rig for a little bit. Then we'll have us a beer."

The three, eyeing me suspiciously, peeled off their coats and hats and hung them on the wall hooks where I pointed. Solly and Wib parked obediently on the sofa, still ogling me. Cholly stood alongside the swivel chair, his eyes on my face.

"Thanks for coming," I told them. "Cholly, you've handled my station before. Fire up anywhere on the low end of 40 with a QRL or a QRZ or a TEST or something."

He didn't move. "We expectin' Uncle Elmer?"

I nodded, realized I was grinning, didn't care. "We are."

"He hasn't been on all week," Cholly said. "We're grateful. We figured you took back your rig."

"I did better than that," I said. "Go on. Fire up."

Cholly sat down in my chair, scooted it up to the operating table, flipped some switches, sent a terse QRL? QRL?, and signed his own call once.

Machine-quality CW came back to him at a stately 15 words per minute. It said, "GE Cholly," and it signed Uncle Elmer's call. A nice little QSO ensued, ended, and Cholly swung around in my swivel chair, his mouth hanging open, his face a question mark. Solly and Wib on the sofa were staring at me too.

I giggled, said, "How about that?"

"That wasn't really Uncle Elmer, right?" Cholly demanded.

"Wrong. That WAS Uncle Elmer. He was using a CW keyboard. I took it to him Monday and made him promise to practice off-air all week, then listen for one of us tonight."

Cholly gulped. He said, "A keyboard? With one finger?"

"No surprises there, if you think about it," I said. "It dawned on me that I've made a living for forty years punching typewriters and then computers with two fingers and a thumb. And I figured if I can type fifty-sixty words a minute that way, Uncle Elmer surely can go fifteen or so with just the one."

There was silence for a time. Then the station speaker began whispering nicely spaced, perfectly formed CW characters. When the short string of CQs ended with Uncle Elmer's callsign, I held my breath for a

Continued on page 59

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ON THE COVER

This month's cover shot comes to us courtesy of Bill Everett W7OO, Everett WA. The iambic hand key (**Photo A**) was made by Bencher, and is used by Bill on the air most of the time.

Photo B shows another part of Bill's collection, a chrome key made in Russia. This is one of only 23 that were imported into the U.S.

The beautiful hand key in **Photo C** was made by Nye Viking as a special run for Icom, whose marketing department presented this to Bill.

Our thanks to Bill W7OO for sharing these with us all. — *Ed.*

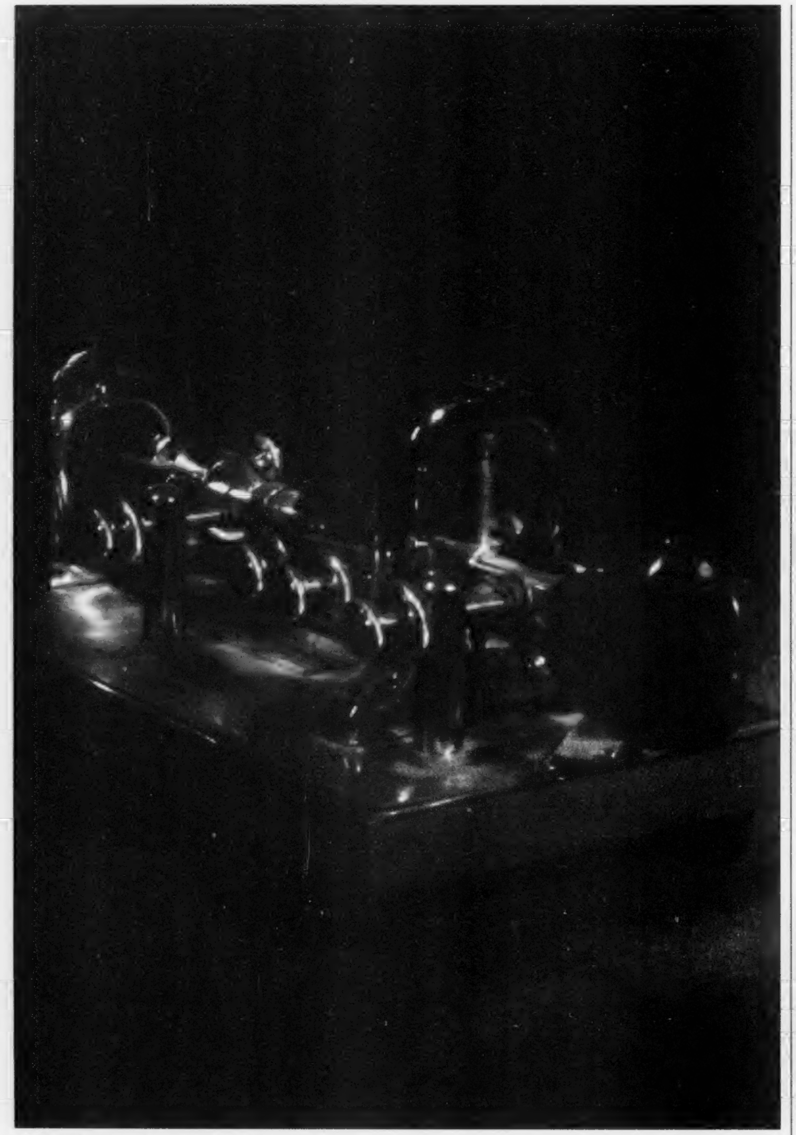


Photo A. *Bencher iambic key.*

Photo B. *A chrome key made in Russia, one of only 23 such items imported into the U.S.*

Photo C. *Nye Viking hand key.*

NEVER SAY DIE

continued from page 8

sclerosis have tested high on mercury. It's been shown to contribute to chronic fatigue syndrome and Alzheimer's disease.

Amalgam fillings are being prohibited in a growing number of the more enlightened countries in Europe and Scandinavia.

I met dentist Hal Huggins several years ago at a science conference and watched his amazing video. He showed patients arriving crippled up in wheel chairs to have their amalgam fillings removed, and then a few weeks later walking around in good health. The ADA pulled his license.

My *Secret Guide to Wisdom* reviews both the Huggins book, *It's All In Your Head*, and Dr. Lydia Bronte's *The Mercury In Your Mouth*. Lydia wondered why she was so sick, and discovered that if the mercury in her 17 fillings had been put on her livingroom floor, the EPA could have quarantined her apartment.

The Euro

The new international currency, the Euro, has been a flop. It started out at over $1.16 to the dollar, and now it's down to a dollar even. How come? Simple.

Any new product has to be a whole lot better than the established product for people to adopt it. In this case, the American dollar has been way out in front as the main international currency for decades. Ninety percent of all of the world's international bank transfers are done in dollars. Thus, the change to the Euro would have been an expensive one, with little in the way of benefits.

Then there's the lousy financial situation most European countries are in, with unemployment skyrocketing. It's in double digits in the Big Four (Germany, France, Italy, and Spain), which account for 85% of Europe's GDP. Their pay-as-you-go pension systems are bankrupt, and getting worse as the average age of their populations increases. That's the same dilemma we face with our so-called Social Security system.

And even Japan does 70% of its importing in dollars and 40% of its exporting.

The Euro has turned out to be another of the 20th century's expensive bad ideas.

Continental Airlines

Continental, which had its problems early on, has turned out to be one of the best-run carriers. I travel on Continental whenever I can, and a recent incident with them just confirmed my confidence.

I sort of inherited Continental. It started for me in the 1930s with Luddington Airlines, which my father went to work for around 1932 as the passenger manager. Then, in 1934, when Tommy Luddington and Amelia Earhart, the owners of the airline, sold it to Eastern Air Transport, I started traveling on Eastern.

Eastern was great, with specials that made it ridiculously inexpensive for Sherry and me to visit Colombia, Guatemala, Martinique, Saint Martin, and so on.

Next, Eastern was bought up by Continental, so I continued buying their yearly passes, which kept the cost of my flights anywhere in the country down around $50 each, one whale of a seniors bargain.

When Eastern and then Continental issued credit cards, Sherry and I ran as many business expenses as we could through them, making possible free flights to Europe — first class!

On a recent trip to El Salvador, when I got home I discovered that someone along the way had unzipped my suitcase and stolen my two cameras (one for fast film, the other slow). I put in a claim to Continental, but I didn't expect anything to come from it but perhaps a letter of regret. Instead, I got a check covering the cost of the cameras, plus vouchers to upgrade us to first class on future flights. Wow!

But then I've always enjoyed Continental. Their service is great and their food just fine. Also, they sure cover most parts of the country.

One of these days, when I get some time (well, I suppose that's just a dream), I want to make a trip through the Pacific islands on Continental, scuba diving at Majuro, Truk, a few other islands, and then go on to Bali. It doesn't cost a lot to make a trip like that these days. Hey, maybe you'd like to come along and make it an all-ham diving trip? I'll bet we could do it in three weeks, if you can get away. Oh, you don't have the time either? Well, that's the way it is for most working stiffs.

College Choice

If you, as a parent, have decided that your teenager doesn't have the motivation (a.k.a. drive) it takes to be an entrepreneur, you'll want to make sure that he or she gets the ticket to being a lifetime working stiff for a large corporation. This requires a college degree. Since our public schools go to lengths to discourage creativity and initiative, your teen will probably fall into this category.

Now, you're faced with the choice of a college. Should you spend the big bucks for an Ivy League diploma?

Presuming that you have been "too busy" to read any of the books I've reviewed on the subject, or bothered to get my *Secret Guide to Wisdom,* the bottom line is that in terms of future earnings, it doesn't make much difference what college your teen goes to. Harvey Mudd College has twice as high a percentage of graduates going on to Ph.D.s as Harvard does. A higher percentage of Cornell College (Iowa) end up in *Who's Who in America* than do Cornell University alumni.

Worse, it's the leading universities which have succumbed the most to providing feel-good courses. Counterculture drivel.

Yes, your kids need an education if they are going to be successful, but achieving one despite our public schools and prestige universities is a real challenge.

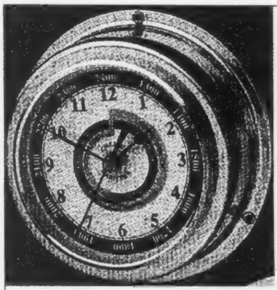
In my experience, there was a world of difference between the seriousness of college students in 1940, just after the depression, and those after the war, when it was "smart" to take the easiest courses and party as much as possible.

The big corporation career path is getting more and more rocky, with corporate buyouts consolidating workforces, information systems making major downsizing of management mandatory, and early retirement a practical way to cut pension overhead. This trend has been turning more and more working stiffs into just plain stiffs.

Ham PR

You either grow or you die. The new FCC regs may help turn around the tailspin our hobby has been in and keep it from crashing

Continued on page 62



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Try a Sensor Keyer

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Just placing your finger over it will cause the transistor to close. I find it very easy to operate, and now I don't have that somehow erratic rhythm.

After I assembled the Heathkit HD-10 CW keyer, I noticed that because it uses one pair of microswitches, the sending was somewhat erratic. I discovered that this keyer has the versatility of allowing the hookup of an external paddle. The ones on the market are from $15 to $25, and some real fancy ones will go up to $40. The price of my keyer complete will run about $39.95; that will put the price at 100% of its value. This paddle also uses switches and contacts in order to produce the characteristic CW rhythm.

The state of the art calls for a transistor to be a switch. Keeping this in mind, plans were laid to produce an all solid state paddle, without the need of switches or contacts.

Next, I was to produce a circuit that would amplify by the touch of the finger and act as a switch. I decided to use a Darlington pair configuration. The gain on this amplifier is about 1000.

By experiments, we know that body resistance is about 10k ohms at skin level. It will go lower in persons who have a high perspiration rate.

I then designed the pattern, which was etched out on a printed circuit board. It resembled several letter Ts together and upside down (see **Fig. 2**). This will cause the finger to act as a resistor when placed over it. After the etching was done, a coat of solder was laid over the design to prevent the lamination form getting tarnished — high salt content will cause this. The etching was done on both sides, to cover one side for "dots" and the other side for the "dashes."

In the schematic, we see that the emitter of Q1 is connected directly to the base of Q2. As the finger is placed

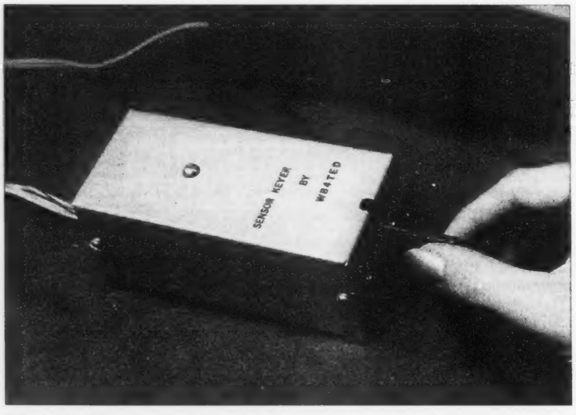

Photo A. The sensor keyer in action.

Reprinted from *73 Amateur Radio,* January 1978.

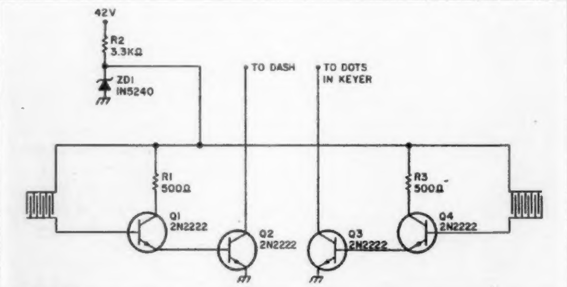

Fig. 1. *R1, Re — 500Ω, 1/2 W; R2 — 3.3kΩ, 1/2 W; Q1, Q2, Q3, Q4 — 2N2222 or equivalent; ZD1 — 10 V, 0.5W 1N5240.*

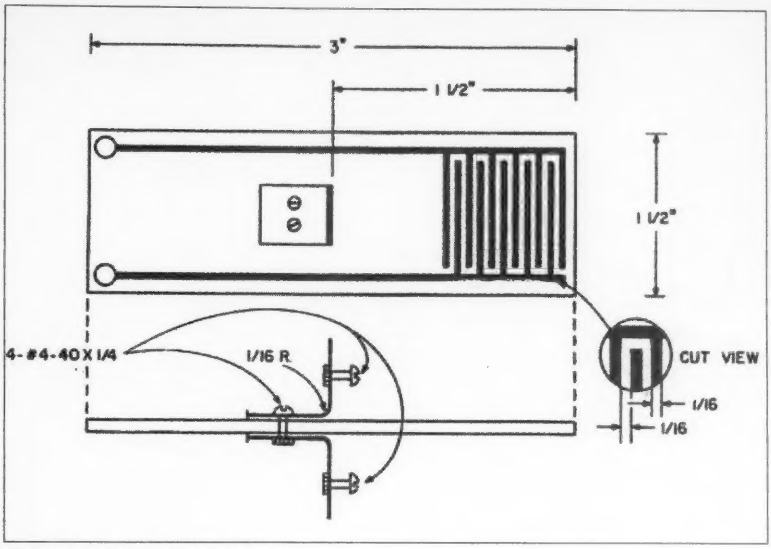

Fig. 2. Etch board on both sides.

over the etched pattern, a little current flows over to the base (Q1). (Ohm's law: I = E/R; 10 V/10k = 1 mA.)

The gain of this transistor will drive Q1 close to saturation. At the same time, Q2 will be driven to saturation, causing it to act as a switch. Presto! We now have a CW paddle.

In order to provide some voltage to the unit from the 42 volts output, we brought it from the back of the Heathkit keyer into the paddle. A 3.3k ohm resistor and a 10 V zener diode in series to ground was used, in order to produce a 10 volts bias to supply Vcc to the transistors.

Construction

Construction is made on a 2"- x 5"- x 2"-high aluminum box. A slot of about 1/8" was cut vertically on the front side, in order to allow the etched board to fit through the box. Two little brackets were formed from a 1/16" sheet of aluminum, bent 90 degrees, and attached with a #4-40 1/4" screw. The same thing was done on the etched board.

Be cautious when placing the etched board, so it will not touch the chassis. This can be easily done with a pair of vise grips to hold it in place before you drill or punch the holes. Another PC board was etched to make the Q1, Q2, Q3, Q4, and regulating circuits. This was placed on the opposite side of the box in order to make room for about 1 or 2 pounds of lead. This is to make it heavier. (Good suppliers for lead are plumbing supply houses.) This lead was fastened to the center and attached with a #8-32 x 3"-long bolt.

The wire used to connect the back of the Heathkit keyer was #22 insulated stranded. To put on the finishing touches, 2" weather stripping was fixed to the bottom of the box so that it would have a better grip on the table or the surface where it will be placed.

The XYL, WA4FUA, has been using it for some time now. At the beginning, she found it very sensitive to operate.

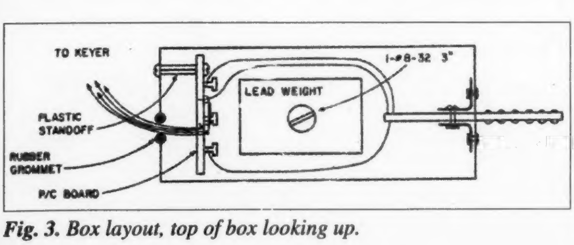

Fig. 3. Box layout, top of box looking up.

She had a little difficulty in trying to get used to it, since there is no need for pushing or waiting for the switch to close. Just placing your finger over it will cause the transistor to close. I find it very easy to operate, and now I don't have that somehow erratic rhythm. —... ...—

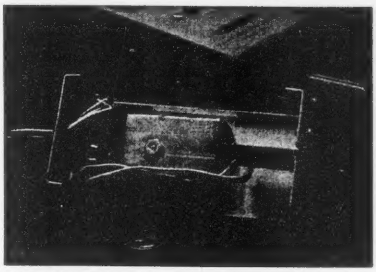

Photo B. Inside view.

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Vaya Con (Ra)Dios

The radio amateurs of Spain — part 1: Catalonia.

I always try to visit new places and see new people. I was in Spain twice before, so why did I go there again? My first trip was in 1970, and that was an "if today is Tuesday, this must be Belgium" type of country-hopping tour. I did not see much of anything. The second trip was in the late 1980s, an exclusive Spanish tour visiting about 6–7 cities in two weeks' time. This was much better, and I enjoyed every minute of it.

The deciding factor for this third visit was my excellent working relations with Xavier EA3ALV, the editor of the Spanish *CQ Radio Amateur* magazine, who translated and published several of my travelogues.

I prepared for this trip by writing to U.R.E., the Spanish Radio Amateur Association, asking their help for finding local hams. For a long time I did not receive any answer, because I addressed my mail to Angel EA1QF, U.R.E.'s General Secretary, not knowing that he lives 200 miles away and comes to Madrid only once in a while. Finally, Juan, the U.R.E.'s Administrative Secretary, answered, and we started a kind of collaboration.

I took a New York–Barcelona nonstop Iberia flight, and in about seven hours I arrived at my destination. Xavier EA3ALV (**Photo A**) picked me up at the airport, and he was the first Spanish ham I interviewed and photographed. Xavier, first licensed in 1954, is an experimenter who likes to build electronic gadgets; he is also a contester and a DXer with 308 entities worked. He is using an FT-920 with a homemade amplifier pushing about 200–300 W into an R-7000 multiband vertical antenna. He is a good QSLer and his E-mail address is [ea3alv@teleline.es].

Xavier's daughter Laura is EA3DBU, and her husband Albert is EC3DBZ, but they are presently inactive.

Like many well-to-do Spaniards, Xavier EA3ALV has a second house; his is outside the little village of L'Ametlla del Valles, about 22 miles north of Barcelona at about 1,760 feet above the sea. What else can a DXer dream for? There in the hills, Xavier has a 48-foot tower installed on an 11-foot-high terrace. On the top of the tower, there is a 7-element yagi for 10-15-20 meters, from Force 12, an inverted V for 40 meters, and another one for 80 meters. Xavier's rig is a TS-520, with an R-4C receiver for working split, and an 800 W TL-922 type of amplifier. His brother, Ramon EA3EJI, lives a couple of streets away. Ramon, a chemical engineer licensed in 1982, is a DXer, works SSB, and has 308 entities for his DXCC.

Photo A. Xavier EA3ALV.

Another amateur living in the same area is Joan-Michel EA3ADW. He was not at home when we passed by, but we saw his 6- by 17-element yagis in diamond configuration used for 2 meter EME, a 7-element yagi for 6 meters, and another yagi for 70 cm having so many elements I could not even count them.

I left my big suitcase with Xavier so that I could travel light, and went to look for a cheap hotel. It was Semana Santa, a weeklong religious holiday. I checked about 15 places until I found a

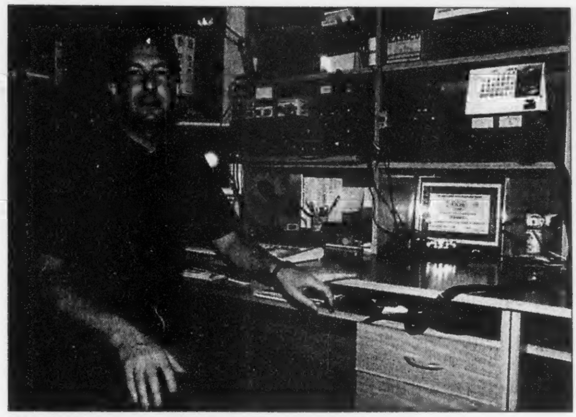

Photo B. *Jordi EA3BCU.*

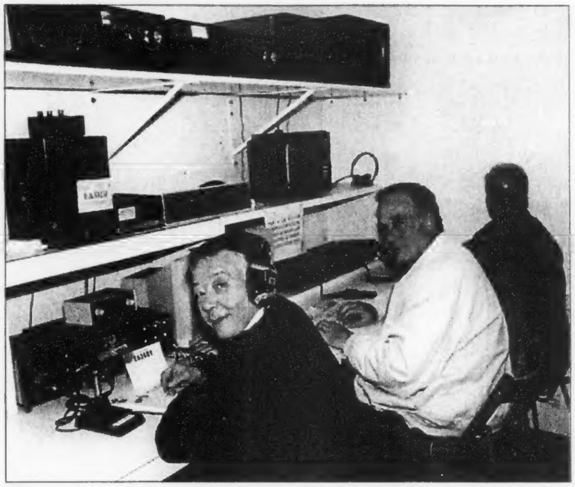

Photo C. *Amadeo EA3AOY, Paco EA3PZ, and Miguel EA3ZA at the EA3MM club station, Barcelona.*

hostel, close to La Rambla, the most famous tourist trap in Spain. La Rambla is a wide street starting from Plaza Catalunya and ending in the harbor. On both sides are countless souvenir shops, money exchangers, eateries, hotels, and hostels. Exclusively, Indians run the souvenir stores. I went to all of them and I did not see one single Spanish merchant or employee.

Bargaining is a necessity, because the merchandise, mostly watches, hats, t-shirts, figurines, knives, dolls and swords, is marked at 2-3 times the selling price. T-shirts, for example, marked for 2,500–3500 pesetas, can be bought for 1,300 pesetas — with the 148 pesetas to a dollar, that still comes to an expensive $9. Most of the tourists are young, and from countries where there is no haggling, so they pay the first asked price, creating a huge profit for the storeowners.

I asked a local amateur why Spanish merchants are not in souvenir stores. He said that this kind of work is below their dignity. I saw Spanish workers cleaning hotel rooms and working in restaurants for much lower income than they would make selling souvenirs; their alleged dignity costs them a lot.

Photo D. *Salvador EA3BKZ.*

Continued on page 34

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21.000	to	21.200	15 m	21.200	to	21.450
18.068	to	18.110	17 m	18.110	to	18.168
14.000	to	14.150	20 m	14.150	to	14.350
10.100	to	10.150	30 m	*No voice privileges on 30 meters. Power is limited to 200 watts PEP in the 30 meter band and in all Novice subbands below 28.1 MHz for all license classes.*		
7.000	to	7.150	40 m	7.150	to	7.300
3.500	to	3.750	80 m	3.750	to	4.000
1.800	to	2.000	160 m	1.800	to	2.000

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CW, RTTY and DATA			BAND	VOICE, CW and IMAGE		
28.000	to	28.300	10 m	28.300	to	29.700
24.890	to	24.930	12 m	24.930	to	24.990
21.025	to	21.200	15 m	21.225	to	21.450
18.068	to	18.110	17 m	18.110	to	18.168
14.025	to	14.150	20 m	14.175	to	14.350
10.100	to	10.150	30 m	*No voice privileges on 30 meters. Power is limited to 200 watts PEP in the 30 meter band and in all Novice subbands below 28.1 MHz for all license classes.*		
7.025	to	7.150	40 m	7.150	to	7.300
3.525	to	3.750	80 m	3.775	to	4.000
1.800	to	2.000	160 m	1.800	to	2.000

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21.025	to	21.200	15 m	21.300	to	21.450
18.068	to	18.110	17 m	18.110	to	18.168
14.025	to	14.150	20 m	14.225	to	14.350
10.100	to	10.150	30 m	*No voice privileges on 30 meters. Power is limited to 200 watts PEP in the 30 meter band and in all Novice subbands below 28.1 MHz for all license classes.*		
7.025	to	7.150	40 m	7.225	to	7.300
3.525	to	3.750	80 m	3.850	to	4.000
1.800	to	2.000	160 m	1.800	to	2.000

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7.100	to	7.150	40 m
3.675	to	3.725	80 m

Novice and Technician Plus classes are limited to no more than 200 watts on the bands displayed in this section.

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144.000	to	144.100	2 m	144.100	to	148.000
			1.25 m	222.000	to	225.000
			70 cm	420.000	to	450.000
			33 cm	902.000	to	928.000
			23 cm	1240.000	to	1300.000

All classes (except Novice) have privileges in designated bands above 1300 MHz and on all frequencies above 300 GHz. Due to recent ongoing legislative changes, it is advised that you check with the ARRL or other reliable sources before commencing operation on those frequencies.

NOVICE CLASS

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Per FCC rules, transmitted power should be no more than is necessary to maintain the desired communication. Maximum power output is 1,500 watts, unless stated otherwise. Power is rated in watts PEP output. Frequencies depicted are in MHz.

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Photo E. Arturo EA3BOA.

Vaya Con (Ra)Dios

continued from page 31

About my hotel room: You've heard of a "hole in the wall" type of room? Well, my room was more of a "crack in the wall" type. It cost me 3,000 pesetas, about $22, and included a skimpy breakfast.

Xavier took me to the offices of the Spanish *CQ* magazine where I met Miguel EA3DUJ, its managing editor for 15 years. I don't speak Spanish and Miguel doesn't speak English, so how come we understood each other perfectly?

Next, we went to see Ramon EA3LP, a retired radio and TV serviceman licensed in 1956. Ramon, a member of U.R.B., Unio Radioaficionats Barcelona, and the Hispano CW Club, is mainly a builder and experimenter. With a home-made rig running 2-3 W, working mostly CW, he has made over DX 100 entities using a G5RV antenna. Ramon has several types of QSL cards.

Mariano EA3FEE was the next one to visit. He has a TS-850, is running 100 W into a 5-band vertical, and worked 140 entities for his DXCC. Licensed in 1980, Mariano is a computer programmer, and the creator of CATLOG, a logging program available on CD that is used by many amateurs.

Xavier also took me to Rafael EA3IH, on 6 meters using the EH3IH call. Licensed in 1949, Rafael is semi-retired. He collaborates with the Spanish *CQ* magazine and with *Top Dance* publication, and worked in public relations for various car manufacturers. He used to work in contests and DX on the lower bands, making over 300 entities mostly on CW, but now prefers VHF and UHF operations. For 2 meters, he has a 19-element yagi, and on 6 meters using an HB9CV type of antenna he has already made 90 DX countries. Rafael is a good QSLer.

From Barcelona, I went on a couple of side trips to Andorra, the island of Mallorca, Madrid and Valencia, subjects of separate travelogues. For the sake of unity, I present all of my Barcelona visits here in one single article.

Next to see was Juan EA3AUX, a retired radio-TV-electronics serviceman who started in amateur radio in 1977. He lives close to the cathedral of Sagrada Familia, and on the back of his QSL card is a color photo of Gaudi's masterpiece. Juan has an FT-1000, an FT-575GX, a TS-520, and a bunch of telegraph keys, because he works mostly on CW. His antennas are a 3-element yagi for 10-15-20 meters and a two-band dipole for 40 and 80 meters. On the wall of his shack, I noticed a photo of HM Juan Carlos EAØJC, the king of Spain, at his radio station.

We also went to see Jordi EA3BCU (**Photo B**), licensed in 1977 and owner of a photographic supply store. Jordi has a TS-850S, a Sommerkamp FT-77, and Heathkit HW-9. He uses a Spanish-made Tagro vertical antenna for 10-15-20-40-80 meters, and a G5RV multiband dipole. Jordi built lots of equipment, and with his homemade 1 W transmitter for 15-20-40-80 meters, he has made many DXs. He also works RTTY, is on packet, and does computer logging. Jordi EA3BCU has an interesting QSL card.

In Spain, paper logging is still required, but nobody checks on that. Many hams, to comply with the rules, maintain paper logs even when they also do computer logging.

Next to visit was the radio club of the Unio Radioaficionats Barcelona, where Xavier EA3ALV is the vice president. They have a good radio station, EA3MM, where we met three operators: Amadeo EA3AOY, a carpet and drape salesman; Paco EA3PZ, a retired electronic technician; and Miguel EA3ZA, a TV service technician (**Photo C**). All three said that they have personal radio stations, too. The club has an employed secretary, organizes classes for licenses, and claims 843 members. Club members have free incoming and outgoing QSL service, but they pay for membership.

Spain has a rich and checkered history. The after effect of the Inquisition is still felt in some places. In a remote mountain village, a car with a foreign tourist broke down. The driver asks an old woman passing by:

"Is there a mechanic around here?"

"God forbid," answered the woman, "Here, everybody is devoted Catholic!"

Talking about devotion, a DXer tried very hard to work the last entity for his DXCC Honor Roll, but could not get through the pileup. He started to pray:

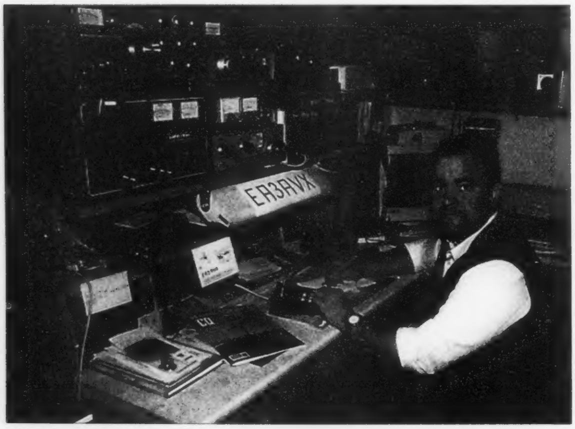

Photo F. David EA3AVX.

Photo G. *Cesar EA3HT.*

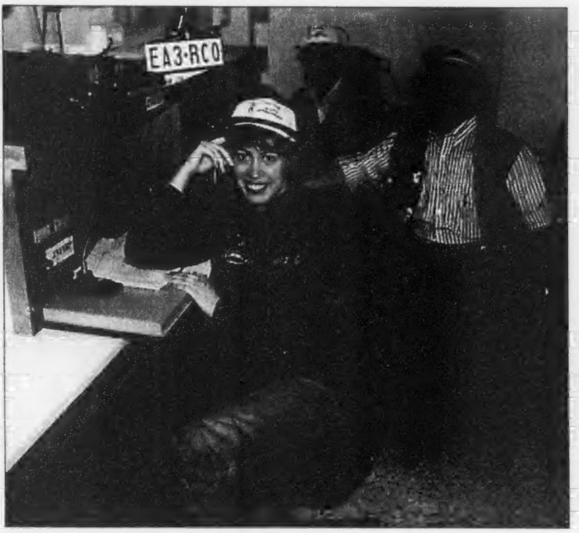

Photo H. *Angela EA3AMD, Fulgencio EA3ERI, and Javier EB3FJS at the EA3RCQ radio club, Barcelona.*

"Almighty God, who can do anything, please let me work this station, and I promise to give one million pesetas to the church."

In that moment the DX station is calling him and he makes the contact, logs it, and fills out a QSL card. Then he continues to pray:

"Almighty God, who can do anything, please let me now find the one million pesetas I just promised you!"

Jaime EA3AJW, licensed in 1992, is

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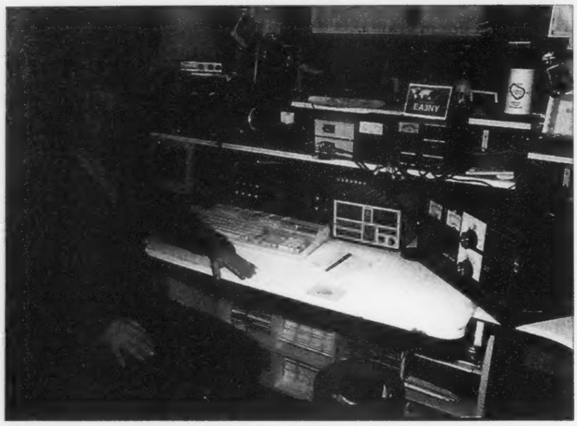


Photo I. Eduard EA3NY.

an auto mechanic. He has a 4-element yagi for 10-15-20 meters made by KLM, a dipole for 12-17-30 meters, and another dipole for 40 and 80 meters. He is a contester and a DXer with over 305 entities worked, mostly on CW (so as not to wake up at night his little girl). Jaime is on packet, has DX cluster, and uses Swisslog. He has QSL cards.

With Xavier EA3ALV, we took a trip to the city of Terrassa, where we saw four hams. The first one, Salvador EA3BKZ (**Photo D**), licensed in 1978, owns Astro Radio, a store where he sells (mostly by mail) antennas, Icom and MFJ equipment, and other stuff for hams. He has a TH5DX type of 5-element yagi for 10-15-20 meters; a 5-element yagi for 6 meters; a 16-element horizontally polarized yagi for 2 meters; a 21-element also horizontally polarized yagi for 70 cm, both made in France by Tonna; a 9-element yagi for 2 meters and a 13-element yagi for 70 cm, both vertically polarized; and a G5RV wire dipole for 10 to 80 meters. For rigs, Salvador uses an IC-271E, an IC-751, a Henry Radio 2KD-5 amplifier, and a KW2000E transceiver made in England. He has worked over 200 entities, is on packet and the Internet, and does paper logging.

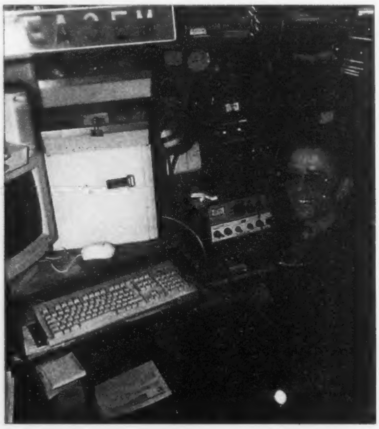


Photo J. Juan EA3EM.

The second ham we saw in Terrassa was Miguel EA3EYS, a retired metal worker licensed in 1982. He has a TS-430S running 100 W to a vertical antenna for 10-15-20-40-80 meters, several VHF and UHF rigs using a 9-element vertically polarized yagi for 2 meters, and a vertical antenna for 2 meters and 70 cm. Miguel is working on SSTV using a scanner or a digital photo camera, and he showed us several pictures he received on the air. He has QSL cards.

Arturo EA3BOA (**Photo E**), a retired truck driver licensed in 1979, was the next ham to visit. He is a builder, and he made his power supply and built several kits for his station. His FT-277B for the lower bands is used with a G5RV, and the TM-733A/E is for 2 meters and 70 cm. On SSTV he worked almost all Europe on 2 and 20 meters, some on 80 meters. Arturo also has QSL cards.

David EA3AVX (**Photo F**), a dental technician, was licensed in 1996. He was the fourth ham I visited in Terrassa. He uses a TS-450S, a TS-520S, an Ameritron AL-811 amplifier, and the MFJ Tuner III. David has a yagi for 10-15-20 meters, a dipole for 40 and 80 meters, a 9-element horizontally polarized yagi for 2 meters, a 13-element vertically polarized yagi for 70 cm, a vertical dualbander for 2 m and 70 cm, and three more verticals for 2 m used for packet, and SSTV.

In the Sarria section of Barcelona, I saw Jose EA3JA, a chemical engineer licensed in 1952. His antenna is a vertical MFJ-1748 for 2 to 80 meters, his rig is an IC-737A, and he uses a homemade power supply and amplifier, and an antenna tuner. He worked 150 entities for his DXCC, only on SSB; the keyer I saw on his table is used only for tuning up the amplifier. His second home with a second station is in Hostalrich, about 40 miles north of Barcelona. Jose also has QSL cards, as virtually all the hams I visited had.

Cesar EA3HT (**Photo G**), in the San Gervasio barrio, is a communications engineer and former air traffic controller who was licensed in 1951. He has a National 200, an FR-500 receiver and FL-500 transceiver, a homemade 1/4-wave ground plane for 20 meters, and a wire dipole for 10-15-20 meters. Cesar works mostly SSB and prefers 15 and 20 meters. His second home is in Torre de Claramunt, about 40 miles northwest of Barcelona, where he has a complete station with a Cushcraft ATV-5 type of antenna for 10-15-20-40-80 meters.

Radio amateurs are known to handle traffic for missionaries, medical teams, and various emergency communications, but the primary activity is still ham radio. Xavier EA3ALV took me to an amateur radio station set up only to handle communications with doctors belonging to Medicus Mundi Catalunya, working in third world countries, primarily in Angola. The operator is Xavier EC3ALP, an economist licensed in 1996 especially for this purpose. The station has a 3-element yagi and is using 100 W and a computer; it does not have QSL cards.

In the Sagrada Familia district of Barcelona, I saw the nicest radio club I ever visited, namely Quixots Internationals, with a very active station, EA3RCQ (**Photo H**). The club has several rooms, nicely decorated with a bunch of attractive awards. Its president is Angela EA3AMD, a photographer licensed in 1994. Her husband Luis is EB3BKE. At home, they have a TS-850, a TS-90, and a wire dipole. Angela works SSB and CW.

The club members meet on Tuesdays and Thursdays from 7 to 9 p.m.

They bring their QSLs to be mailed and pick up the ones that arrived. There are courses for CW and electronics. While there, I met many amateurs: Angel EA3BAF, Godofredo EA3AXL, Jaume EA3CSY, Pedro EA3AOP, Jose EC3DFU, Diego EA3BAS, Daniel EB3BBJ, Javier EB3FJS, Luis EA3GGY, Santos EA3AZF, Fulgencio EA3ERI, and others. Their E-mail is: [calfor@bcn.servicom.es] but they did not answer my inquiry.

When I had no visits scheduled, I went sightseeing. The huge old cathedral is very impressive indeed. The construction of the Sagrada Familia Temple is continuing at the same slow pace that I noticed 29 years ago. In 1970, I asked our guide:

"When they finish it?"

"Never, because they keep collecting money to work on it, and once the job is finished they can not collect anymore!" I believe that guide was on to something.

I am sorry that I did not go to the aquarium, supposedly the best in the world. However, I did go to the Museum of Contemporary Art. I paid 750 pesetas to enter a nice modern building, but I did not see too much inside.

At an exhibition of modern art, a visitor looking at a painting exclaims laughingly:

"I never saw an angel with six fingers!"

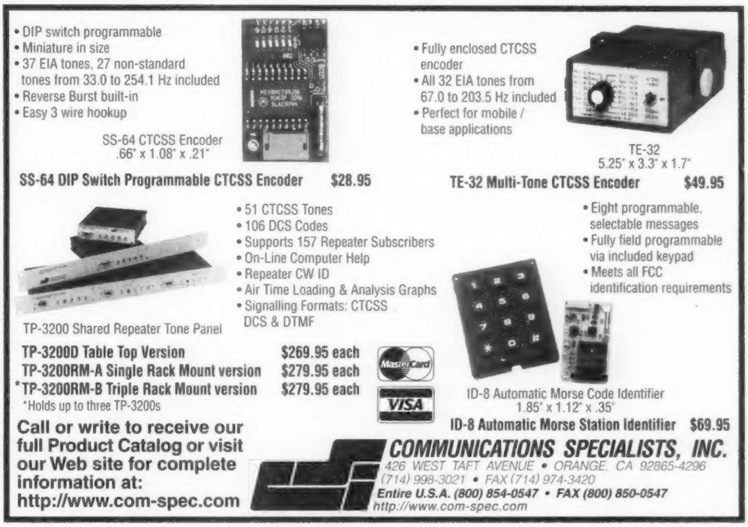
The artist who overheard the uncomplimentary remark answered with indignation:

"Did you ever see an angel with five fingers?"

I also saw the Picasso Museum. I paid 700 pesetas to see it; I liked the ceramics and painting section but did not care at all about his engravings. I particularly like a painting called "Portrait of Madame Canals." You know, the kind of portrait that no matter from which angle you look at the sitter, it seems that the sitter looks at you. It becomes a personal relation, an interactive situation, to use today's expression. Well, I liked Madame Canals a lot, but from any angle I looked at her, she just looked over my head. I kept moving back and forth in front of her — maybe, just maybe, she would look back at me, but she continued to ignore me. I even pretended that I was leaving the room and then quickly turned around, hoping that I would catch a glance of her — but nothing: She pretended that I was not even there. I left the museum depressed and disappointed.

The next morning, I went to Andorra, returning two days later and continuing to visit the Barcelona hams.

The first to see was Eduard, or Eddie EA3NY (**Photo I**), owner of Bit Radio, a store dedicated to the needs of the radio amateurs: antennas, transceivers, and various accessories. Eddie, a graduate of the University of Telecommunications of Barcelona, was licensed in 1987; he worked for Kenwood and opened his store 12 years ago. His contest and DXing station is installed in his father's penthouse, on the 10th floor of a tall building in the village of Esplugas, just outside the big city. His 48-foot tower is on the roof, about 150 feet from the ground, with an unobstructed view all around. Eddie has a Cushcraft X9 yagi with an additional element for 40 meters, a fixed 10 to 40 meter single-element rigid dipole for checking propagation and multipliers with a TS-570D, and a sloper for 80 meters. He is using an FT-1000 and a big amplifier. The legal



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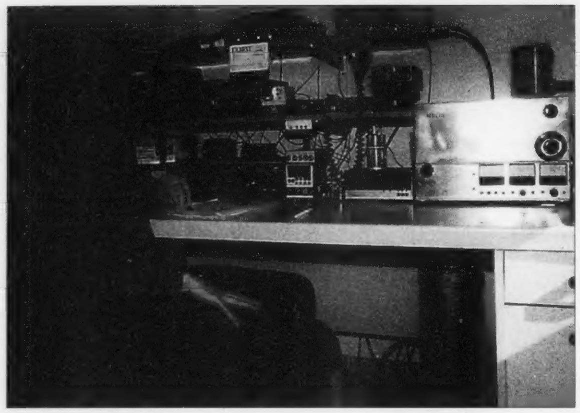

Photo K. José EA3DXU.

limit in Spain is 800 W, but during my visits I saw several 2–3 kW amplifiers.

Eddie EA3NY is a DXer with over 300 entities worked. A contester and DXpeditioner, he has operated as ED3NY, AM3NY, S07NY (Western Sahara), FS5PL, FG5BG, EA8ZS, EA9AM, EA6URP, and F/EA3NY/P from EU-064, all with excellent results. He has QSL cards, and his E-mail is [ea3ny@writeme.com].

Eddie was on the phone for two entire hours setting up appointments for me to meet with local hams, as well as with some in Valencia, where he advised me to go.

Jordi EA3GEP, an elementary school teacher and licensed in 1989, was the next to see. He has a 35-foot tower installed on a roof 80 feet from the ground. Jordi has a 3-element TH-3 Jr. yagi for 10-15-20 meters, a single-element monobander for 17 meters, an inverted V for 40 and 80 meters, and a double sloper for 40 meters. His rig is a TS-850S followed by an SB-1000 amplifier. Jordi EA3GEP is a builder, contester, and DXer with over 275 entities, and is using Swisslog. He has a nice QSL card.

The next ham to see was Ramon EA3KB, licensed in 1982 and owner of a food store. His 38-foot tower, installed on the roof 96 feet from ground, is supporting an A4-type Cushcraft 4-element yagi for 10-15-20 meters, with an extra element for 40 meters, a single-element rigid Cushcraft yagi for 12-17-30 meters, and an inverted V for 80 meters. He has an IC-751A and an AL-811 Ameritron amplifier running 700 W. For logging, Ramon is using the PLOG program made in Spain, and Swisslog. He has worked 327 entities, and has 5BDXCC and many difficult-to-obtain awards. He is a DXer and an island chaser, having certificate #1 of the Spanish Islands Award, and he has worked 726 IOTA islands. Ramon EA3KB has two kinds of QSLs, one with a color photo showing the Barcelona Olympic Port. He has worked both EA0JC and JYI.

Eddie EA3NY arranged for Juan EA3EM (**Photo J**) to meet me at a certain metro (subway) station and recognize me by my cap with my name and call. Juan first took me to the city of Sta. Perpetua de Mogoda, about 7 miles away from Barcelona, to see José EA3DXU (**Photo K**), an electronics engineer licensed in 1982. José is known for his EME work! He has made over 2000 QSOs on 2 meter EME, with 363 different stations in over 60 countries, all on CW. His 2 meter EME transmitter starts with a Standard C58, followed by a Standard CPB-58, which leads to a Mirage B108, and finally to a homemade 2.6 kW amplifier using a 4CX1500B tube. His 70 cm transmitter starts with a TS-790E and is followed by a 1.4 kW amplifier made by LZ2US, with a GS23B Russian-made tube. José's tower is 35 feet high, installed 25 feet from ground. He has a double 17-element yagi for 2 meters, and a double 38-element yagi for 70 cm, both from K6MYC. He works only VHF and UHF, and is using 20 meters only to arrange schedules for EME.

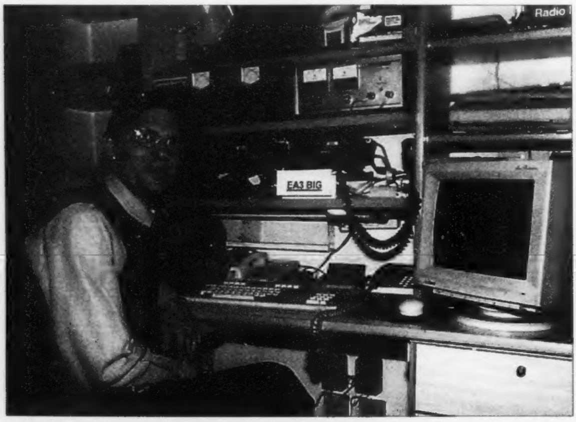

Photo L. Manuel EA3BIG.

Next, Juan EA3EM took me to his station in La Llagosta. Licensed in 1985, Juan is a truck driver delivering cosmetics all over the province. His tower stands 29 feet tall on the top of his house, 38 feet from ground. He has a Hy-Gain TH-3 Jr.3-element yagi for 10-15-20 meters, a homemade 5-element yagi for 6 meters, two 17-element 17B2-type Cushcraft yagis for 2 meters, and an inverted V for 40 and 80 meters. Juan is a contester and DXer, using 500 W on SSB and CW. He has QSL cards, and his E-mail is [ea3em@intercom.es].

Continuing the visit, Juan took me to L'Hospitalet de Llobregat, right near Barcelona, to see Manuel EA3BIG (**Photo L**). Licensed in 1978, Manuel is a technical director in a company doing electrical installations. As the president of the Radio Amateur Association of Catalonia, Manuel is doing mainly organizational work; for example, he installed and ran an amateur radio station at the 1992 Barcelona Olympic Games, using the EG0JOB and EH0JOB callsigns. His 38-foot-high tower stands on the roof 32 feet from ground. He has a 3-element yagi for 10-15-20 meters, an inverted V for 40 and 80 meters, a 15-element yagi for 2 meters, and a 23-element yagi for 70 cm, both horizontally polarized. Manuel works some 2 meter contests, sometimes operates SSB on 20 and 40 meters, and has QSL cards.

With Manuel EA3BIG, Juan EA3EM, and Jaume EA3CT, we had a long discussion about how amateur radio is organized in the U.S. Jaume facilitated the conversations by doing some translations. His wife Rosa-Maria is EA3ANY.

Next day, I went to the Les Corts section of the town to visit Luis EA3OG, an editor and publisher of children's books, licensed in 1961.

He is using a Drake TR7 with the MN7; for satellite work, Luis has an IC-245E for 2 meters and an FT-780R for 70 cm. For tracking satellites, he is using the INSTANTTRACK program. Luis works SSB, CW, and RTTY, is on packet, has DX cluster, and does computer logging. He has a nice QSL. In his second home in Villassar de Mar, about 16 miles from Barcelona, Luis has a Titan Gap for 10 to 80 meters, an IC-455, a TS-711E for 2 meters, and a TS-811E for 70 cm.

I had three Barcelona experiences I would like to mention:

1. I was eating at Burger King and a stranger sat near me without having any meals. He was fidgeting for a while, then placed his jacket on a chair nearby on which were the belongings of two ladies from France, stretched his hand under his jacket and took a handbag. Another tourist saw this maneuver and intervened, even going outside and bringing two cops, who took the stranger away.

2. At a subway station, I was trying to get in a car, but a man acting hesitant and confused was blocking the entrance. I pushed him with both of my hands and in that moment another man unbuttoned my back pocket and put his hand in. I felt it, turned around and slapped his hand yelling "You dirty thief!" and other less than flattering remarks. The two men left the train before the doors closed. The people around me had no reaction; or maybe they did not understand what happened, or else they were too accustomed to such events.

3. My "crack in the wall" type of room had no inside doorlock, so every evening I placed a chair near the door. One night, somebody opened my door and pushed it, but could not enter. I woke up wondering if the would-be intruder had been a female and that had been my lucky day, or if it had been a man looking for some extra cash. I called up the front desk and told the clerk what happened. He said, "That's OK …" and hung up. I guess that was no news to him.

I met Magi EA3UM (**Photo M**) at the statue of Columbus, right near the harbor, again prearranged, and wearing my cap with my name and call on it. He took me to his house in Castelldefels. Magi, a communications engineer licensed in 1968, owns a microwave communications company near the airport. I saw parts of his company, with people working or just hanging around, through his security cameras linked by microwaves to his home. Magi is active on EME, SSTV, ATV, SSB, CW, and RTTY; there is not too much left after these.

He has a 70-foot tower with a personal elevator, and on its top is a 22.5-foot parabolic dish for EME. On a building separate from the main house, where he has his radio station, workshop, etc., there is a dish almost 6 feet in diameter for TV satellite reception, and an 11-foot dish for 13 cm SETI, always receiving.

Magi is a coordinator for SETI, the Search for Extra Terrestrial Intelligence. I noticed that his antenna for SETI is pointed to outer space, probably because there is not much intelligence found on Earth (see the constant wars among people). Magi has a roomful of equipment: an IC-R70 general coverage receiver for 100 kHz to 30 MHz, the R-4B and T-4XB pair from Drake, an IC-R8500 receiver for 100

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***Photo M.** Magi EA3UM.*

kHz to 2 GHz, a TS-780 rig for 2 meters and 70 cm, an IC-1271E for 23 cm, and a 1kW amplifier for 6-10-15-20 meters. On a separate rack, he has all homemade equipment: a rig for ATV, antenna movement controller, various converters, amplifiers for 23 cm, amplifier for ATV and for 70 cm EME. His powers used on EME are: 2 kW on 70 cm, 2 kW on 23 cm, and 1 kW on 13 cm. Magi has a QSL showing his EME dish.

I went to see Alberto EA3CR, outside the village of Guardiola de Fontrubi. An insurance broker, he started in amateur radio in 1974. He has a 65-foot tower on the hills, 1280 feet above the sea level. He uses a 5-element monobander from KLM, on a 42-foot boom; an inverted V for 40 meters; and another one for 80 meters. Soon, he will install his new Hy-Gain 105CA monobander for 10 meters, on a 24-foot-long boom. The tower can be loaded for 80 and 160 meters with an outdoor matching device. For reception on the 160 meter band, Alberto has an EWE type of wire antenna, similar to a Beverage, but much shorter. He uses an FT-1000 with an Ulvin Tremendus III amplifier running 2 kW output, and an FT-221R for 2 meters. Alberto works SSB, CW, and SSTV, and has 318 entities for his DXCC.

About working DX, I liked the riddle posed by Rod AC6V:

"How many ham radio operators does it take to constitute a pileup?"

"25 — the callee, a caller, and 23 cops telling them that he is listing up!"

Again prearranged, I met Juanjo EA3CB where Plaza Catalunya meets La Rambla. He took me to Vilanova i la Geltru, 28 miles from Barcelona. Juanjo's full name is Joan Josep Mota i Tarruella, and who can top that? I noticed that many Spaniards have very long names and live in places with similarly long names. Is this the reason that no Spanish *Callbook* was published for five years? Perhaps too many words require too much work.

Juanjo, licensed in 1979, is a broadcast technician for an FM radio station. His 34-foot tower sits on a 64-foot-high roof. He has an Explorer 14; a 4-element yagi for 10-15-20 meters from Hy-Gain; an inverted V for 30-40-80 meters; a ground plane for 2 meters; and another one for 2 meters and 70 cm. Juanjo is using the R-4C, T-4XC with the L7 amplifier, pushing about 900 W. He works SSB, CW, RTTY, and some SSTV. For logging he is using DX4WIN. He is the vice president of the prestigious Lynx DX Group, has worked 325 entities, and EA0JC, second operator José. Juanjo worked as SV8/EA3CB/p, SV9/EA3CB/p, FG/EA3CB/p and in group operation as S0A (for CW0), and S02R (for SSB). He has a nice photo QSL card showing the operator at his station and his tower with his antenna. His E-mail is not easy to remember: [L124808303@abonados.cplus.es].

Also in Vilanova, we visited Arsenio EA3NI, a retired electro-domestic storeowner. He started in amateur radio in 1960. He has two towers on his 48-foot-high roof: a 30-footer has a Hy-Gain TH5DX 5-element yagi for 10-15-20 meters, and the other one, about 35 feet long, carries his homemade 5-element yagi for 6 meters. He also has a longwire for 30-40-80-160 meters, a dipole for 80 meters, and a 4-element antenna for 2 meter packet cluster. Arsenio uses an IC-751A and a TS-830S, and has two amplifiers; one homemade runs about 400 W, the second about 1 kW. He uses a computer for logging with the DXLOG program, and has worked 343 entities, mostly on SSB. He has QSL cards. Now his brother Clemente EA3VM is running the store.

Continued on page 59

***Photo N.** Pere EA3AJI.*

***Photo O.** Miquel EA3NB.*

Radio Direction Finding

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ARDF Takes Off in 2000

Have you tried hidden transmitter hunting in the woods yet? Whether you call it foxhunting, foxtailing, radio-orienteering or ARDF, the year 2000 will bring more of it to more places in the USA than ever before.

Five years ago, only a handful of stateside hams had experienced international-style foxhunting, even though it had already been popular in some countries of Europe and Asia for fifteen years. After inroads were made by the Friendship Amateur Radio Society (FARS) of Portland, Oregon, we sent a small team of self-admitted beginners to the ARDF World Championships in Hungary during September 1998. "Homing In" had photos and stories in the January 1999 issue.

This led to FARS staging the first multination ARDF contest in the USA to be sanctioned by the International Amateur Radio Union (IARU). Eight states and eight foreign countries were represented at this event, held in Portland in August 1999. Again, you read it in "Homing In" — see the October 1999 issue.

Without exception, the stateside participants returned to their hometowns as enthusiastic ambassadors of ARDF. For instance, Marvin Johnston KE6HTS is busily planning ARDF adventures for members of the Santa Barbara Amateur Radio Club (SBARC). His zeal for the sport had already brought Mike and Brian Peddicord (KE6OTM and KF6DZN) to the 1999 Portland Championships. Now more hams in his area are catching foxhunting fever, following this year's first SBARC on-foot hunt on March 18.

As past president of SBARC, experienced in organizing several ham radio conventions, Marvin understands the intricacies of financing large amateur radio endeavors. He's working to find creative funding opportunities for future ARDF championship events. If you have ideas, I'm sure he would be eager to discuss them with you.

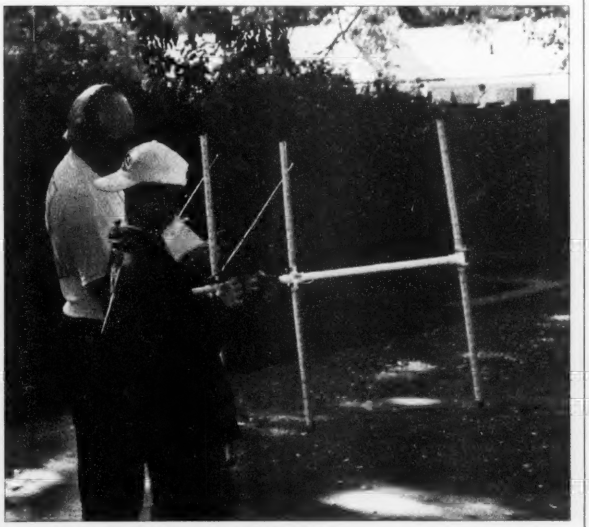

Photo A. *Jay Thompson W6JAY had just turned 14 when he won medals in the Portland championships. Here he demonstrates how a simple beam of PVC pipe and steel tape, plus an offset attenuator, is all you need to go foxhunting with a two-meter handie-talkie. Beside him is his father, Richard WA6NOL.*

Creative designers sought

On the technical side, work continues to make affordable ARDF equipment available to hams in this hemisphere. There are "de facto standard" receiver/antenna sets for each ARDF band (80-meter CW and 2-meter AM) in many countries of Europe and Asia. Most of these sets aren't the ideal here. For instance, the wide IF stages of Russian "Altai" two-meter ARDF units are sometimes incompatible with crowded USA band conditions.

Most foreign-made two-meter ARDF sets have AM detectors, but FM is the most popular stateside mode. FM signals can be slope-detected on these AM sets, but that makes the modulation difficult to copy. Audio strength indicators are less effective when the signal is tuned off-center. Despite this, ARDF sets from Ron Graham Electronics in Australia have found favor among many radio-orienteers here. "Homing In" for December 1997 has a product review.

Mizuho, a Japanese company, makes synthesized ARDF sets with selectable AM/FM modes for two meters. They are not imported by any USA dealers, nor have they been FCC certified. One reason might be the anticipated price. It's hard to imagine equipping a Scout troop with lots of ARDF units if each one costs several hundred dollars.

So here's the challenge: Let's find a way to import or manufacture some effective and affordable ARDF receiver/antenna sets, either kit or wired/tested. That's one way to make plenty of them available to budding foxhunters of all ages.

Fortunately, it's already possible for you to get started in two-meter ARDF at very low cost, if you have a handie-talkie or pocket scanner that covers the band. Just build a simple beam or quad, plus an offset attenuator. The beam shouldn't cost more than ten dollars and the offset attenuator can be built for about 15 bucks from parts you can probably find locally (**Photo A**). Check

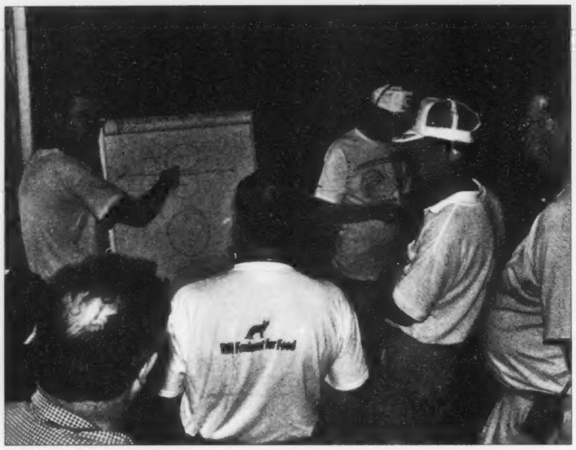

Photo B. *Rik Strobbe ON7YD, Interim Chair of the ARDF Working Group of IARU Region 1 (Europe and Africa), gave important lessons to both competitors and event organizers at the Portland championships last year. He also provided some 80 meter ARDF gear.*

your back issues of *73* for "Homing In" plans (the May 1996 and May 1998 issues, for instance) or visit my Web site.

Eighty-meter ARDF is another matter. We're very new at it. In fact, the very first 80m radio-orienteering event on this continent was at the Portland championships last year. Almost all of the receiver/antenna sets used by Team USA were on loan from the European visitors, including Rik Strobbe ON7YD of Belgium (**Photo B**) and Panayot Danev LZ1US of Bulgaria.

Groundwave signals on 80m tend to follow the curvature of the Earth. They don't reflect from buildings, mountains, and trees as two-meter signals often do. That makes 80m ARDF much more straightforward. Worldwide, the winning times on 80m hunts are almost always shorter than those of 2m hunts on the same size courses. For that reason, 80m may be the better band for introducing youth and Scouts to the sport.

Harley Leach KI7XF is one of several Portland attendees who are now promoting 80m ARDF. Harley, who teaches electrical engineering at Montana State University, surprised everyone by his performance at Portland, considering that he had very little prior ARDF experience. Now KI7XF has obtained European-made 80m ARDF kits for several ARDFers here. We're evaluating them to see if the design is suitable, prior to ordering more.

Photo C. *Bob Frey WA6EZV slimmed down and shaped up to prepare for Portland, and his efforts were rewarded with medals. Now he's organizing events and promoting the sport in the Midwest.*

DFer Jerry Boyd WB8WFK of Albuquerque, New Mexico, was the only Team USA 1999 member to bring his own 80m ARDF set to Portland. He built it himself and still continues to optimize his design, experimenting with both circular loop and ferrite rod RDF antennas for that band. I'm sure that he would welcome the opportunity to exchange correspondence with other 80m ARDF receiver experimenters. I would, too.

The orienteering connection

From their homes in the Cincinnati area, Bob Frey WA6EZV (**Photo C**) and Dick Arnett WB4SUV are promoting ARDF over a wide area of the Midwest, emphasizing the physical and orienteering aspects of the sport. First introduced to it at the Dayton Hamvention™ Foxhunting Forum that they hosted last year, both have pursued personal training programs that are likely to make them serious medal contenders in future championships.

As part of their outreach efforts, Cincinnati foxhunters introduced the sport to 60 Scouts from seven troops at the annual Jamboree-on-the-Air (JOTA) last fall. WA6EZV and WB4SUV first divided the Scouts into groups of six and taught them the principles of direction-finding, including the functions of directional antennas and attenuators. The Scouts then paired off and tried it for themselves. Bill Schroeder WD6ADM and Stuart Press KC8HQT assisted Bob and Dick with help to the Scout pairs.

Now it was time for a contest. Teams of two Scouts from each of the troops were selected and the clock was started. Which troop's team would win by finding the two hidden transmitters in the shortest time, without assistance? The competition was fierce, and apparently the training was very good, as all the finishes were within about ten minutes of each other. There's no doubt that this contest whetted their appetites for more. As WA6EZV wrote, "Repetitive requests to 'do it again' provided us with the satisfaction that the Scouts indeed enjoyed the event and gave us a feeling that the day was well spent."

The next Cincinnati-area ARDF event for all ages will be on Sunday, May 7, at McFarland Woods, sponsored by the OH-KY-IN Amateur Radio Society and the Cincinnati Orienteering Group (OCIN). An hour of training and demonstrations will be begin at 10 a.m., followed by four hours of foxhunting starting at 11. Both 80-meter and two-meter courses will be provided. A limited number of receiver/antenna sets for both bands will be available for loan.

If you're heading for the Dayton Hamvention in May, be sure to take your on-foot RDF gear for two meters. WA6EZV and WB4SUV promise that there will be another prize-filled foxhunt to challenge you, just like the 1999 hunt that was described in "Homing In" last September. Well, it won't be "just like" last year — they say they have some new surprises in store.

The Hamvention's Foxhunting Forum is a great place to hear about the latest RDF news and technologies. This year's scheduled speakers include Jacques Brodeur VE2EMM with his microprocessor-based mobile Doppler set, and Brian DeYoung KE4HOR with his new laptop bearing display interface. Start times of the forum and foxhunt aren't firm as of this writing, but the information should be on the "Homing In" Web site by the time you read this.

WA6EZV and WB4SUV are working with Sam Smith N4MAP of Atlanta to bring the sport to southeastern states. Sam, who is active in the Georgia Orienteering Club (GAOC), put on his first full-scale radio-orienteering event in conjunction with a classic orienteering meet last October 30 at Cochran Mill. Sixty persons attended this combined event.

Another Atlanta area radio-orienteering event followed in the next month. Two more will have been held by the time this issue reaches you. The next one is scheduled for April 30 at Red Top Mountain State Park near Cartersville, GA. Like the Cincinnati event the next week, training will begin at 10 a.m., with the hunt at 11. For more information, contact N4MAP at his *Callbook* address, or via the E-mail and Web links at the "Homing In" site.

Next, the world

European and Asian ARDF champions are some of the most fierce competitors around, but they are also some of the most friendly and helpful hams that you will ever meet. Since the USA first arrived on the world ARDF scene, these champs have welcomed, supported, and encouraged us every step of the way. They want us to succeed.

The invitation I received today for USA hams to participate as visitors at a Ukrainian ARDF event in mid-April is just one of many that now arrive regularly. We aren't yet ready to send large teams to these European and Asian national hunts, but unattached individuals are usually welcomed. So if you would like to add ARDF to your next overseas vacation, contact me or get on the Web to find out what opportunities are available.

The biggest event for Team USA this year will be the ARDF World Championships, taking place in Nanjing, China, from October 13 through 18. The Chinese Radiosports Association (CRSA) is planning a full program of cultural and tourist activities, in addition to world-class courses on both ARDF bands.

Twelve hams from seven states have already expressed interest in traveling to this event. We can send up to three competitors per division. Age divisions are Juniors (under age 19), Seniors (19 through 39), Old-Timers (40 through 54), and Veterans (55 and over). As of this writing, CRSA has not announced if there will be separate age divisions for women or if all women will compete in one division.

There's room for more on ARDF Team USA 2000. You don't have to be a star athlete, but you should be able to walk, jog, or run through forest trails for a two-hour period. Family members may accompany competitors to the festivities and foxhunt venues, but they cannot go out on the courses.

To view the official invitation to the championships and the latest information about Team USA, visit the "Homing In" Web site. To be added to the list of prospective Team USA members and get answers to your questions about our team, contact me via electronic or postal mail. Time is of essence, because diplomatic and travel arrangements must be made well in advance.

Team USA membership is limited to persons with USA citizenship or resident alien status. To be considered for another country's team, contact that country's national Amateur Radio society. For instance, in Canada, contact Radio Amateurs of Canada (RAC). RAC's ARDF Coordinator is Perry Creighton VA7PC.

Here in IARU Region 2, only USA and Canada have ARDF Coordinators at this time. If you wish to represent any other country in North or South America at the Championships, please contact both your national society and me.

Whether you're a marathoner or a "shack potato," you can help ARDF promote our hobby and increase international goodwill. Work with your local club leaders to schedule and organize foxhunts. Warm up the soldering iron, clean the clutter from the

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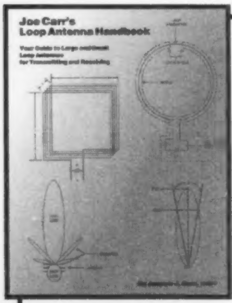

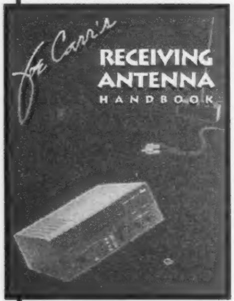

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workbench and build some fox transmitters, antennas, and attenuators. Talk up ARDF among youth and Scout leaders in your town.

When you're in a ham radio QSO, don't forget to mention your foxhunting activities. A discussion of your latest RDF equipment project or tales of your last competition might result in more participants at your club's next foxhunt. Don't limit your ARDF talk to the local repeater — mention your interest on the DX bands, too. We need to encourage more countries to develop ARDF programs, particularly here in the Western Hemisphere. As IARU's ARDF Coordinator for Region 2 (North and South America), I want to hear from anyone on these two continents who wants to get the ARDF ball rolling.

From foxes to owls

Once you have learned the basics of tracking virtual foxes in the woods, consider using your skills to help save a real threatened species. You may even be able to help from the comfort of your hamshack. More volunteers are needed for the Burrowing Owl Project. Forty-eight of these creatures, fitted with miniature radio transmitters between 172 and 173 MHz, migrated from Saskatchewan and Alberta in the fall. Where are they now?

Most likely they spent the winter in southwestern and south central states. Some might have ended up in northern Mexico. They are probably beginning to head northward again for the spring breeding season as this issue arrives. But no one knows for sure. That's where you come in.

The 1999 fall migration monitoring project was announced in the amateur radio press in late September. On October 5, Peter Vekinis KC1QF monitored the 172 MHz band from an aircraft over portions of Arizona, New Mexico, and Colorado. He reported a pulsed signal near Interstate 10 southeast of Tucson, copyable for about five miles of his travel. This signal was not confirmed on the ground.

On October 11, Robert Lentz K5BL reported a pulsed signal on a different frequency at his home near McKinney, Texas, which is about 33 miles NNE of downtown Dallas. The signal was audible for several hours, but was not tracked down. Then on December 27, James Kaelin K5DXM received weak pulsed signals in Lavaca, Arkansas, 14 miles east of Fort Smith. Frequency was the same as the signal heard by K5BL. K5DXM's beam indicated northward direction. The signal disappeared after two days.

Based on these reports, I increased the winter monitoring area to include all southern states from California (Imperial Valley and points east) through Arkansas and Louisiana. During the anticipated northward migratory period from late March through early May, monitors are needed from these areas northward through Montana and North Dakota.

If you have a sensitive receiver, scanner, or wide-range handie-talkie that tunes up to 173 MHz, you can join the effort. If you have radio direction-finding gear for that frequency range, so much the better. Perhaps you'll be the first to sight a living banded Canadian burrowing owl in the USA.

For all the details, see the burrowing owl page of the "Homing In" Web site. You'll learn more about this interesting species of owl, which prefers living underground in grasslands and deserts instead of perching in trees. There's also a list of the 33 still-active bio-tag frequencies and information about suitable equipment for monitoring and RDF at 172 MHz. Most important of all, there's information on what to do if you receive a tag signal. To those of who have faithfully monitored since September, please accept my sincere thanks, plus the thanks of the Canadian researchers.

Number 45 on your Feedback card

Michael Bryce WB8VGE
SunLight Energy Systems
955 Manchester Ave. SW
North Lawrence OH 44666
[prosolar@sssnet.com]

The Vectronics VEC1340K

There's no question about it, running QRP is as simple as reducing the power of your transmitter. Lots of people have tried QRP this way and have found it very enjoyable. On the other hand, if you don't like to be 549 all the time, you can crank up the power and go on with your hamming. You're not out any money, just some time.

But, for the real fun of QRP, you just have to have a QSO with a station with equipment you have built yourself. There's zillions of kits and construction articles around. If you're not into building from scratch, then the use of a kit is the best bet going.

In the not too distant past, most of the QRP kits were simple crystal controlled transmitters. You used your transceiver or station receiver and transmitted with the kit. It was simple and easy to do. All you had to come up with was a suitable transmit and receiver switching scheme.

However, today's QRP kits offer microprocessor control and computer interfaces. For a first time kit builder, they can become a major project. Thankfully, there's a new company that is offering a smattering of kits, including several QRP transmitters and QRP transceivers. I am talking about Vectronics.

The Vectronics kit VEC1340K is a QRP transceiver for the 40 meter band. It's CW only and uses a VXO for tuning.

A closer look at the Vectronics QRP transceiver

The Vectronics is based on some rather simple designs. The direct conversion receiver is mated to a three-stage CW transmitter. The operating frequency is controlled by a VXO. The receiver is a direct conversion unit that uses a NE602 and a LM386. The NE602 is both the VFO mixer and product detector. The LM386 provides speaker volume and is the only active device in the audio chain.

A brute force RF gain control is ahead of a simple tuned circuit before the NE602. The tuned filter is designed to allow the required signals into the mixer and yet keep unwanted signals out.

After the VXO signal and the incoming signals mix, the output is fed directly into the audio amplifier. There are no high or low pass filters in the audio chain.

A crystal controls the transmitter. The crystal for the QRP calling frequencies is included in the kit. A variable capacitor is used to control the VXO. From the VXO, the signal is buffered by a driver stage before being sent along to the final transistor, a 2N3055. The transmitter will produce over one watt of RF at 12.5 volts.

The entire Vectronics transceiver is built on a single-sided PC board that measures 4-3/4" by 5-1/4" inches. The PC board is epoxy glass with a solder mask on the copper side. There is a clear component silk screen on the component side. The board does not have plated holes, nor is it solder-plated. The transceiver is protected from reverse polarity by a diode and PC fuse. That's something you don't usually see in a kit in this price class.

Building the Vectronics transceiver

This is a simple kit to assemble. If you have ever melted solder, you can easily construct this transceiver. For such a simple kit, the instruction manual weighs in at over 37 pages.

There's ample information about inserting the parts and basic soldering. There's even a section on identifying the various resistors and capacitors. Although not a Heathkit by any means, the check-off-as-you-stuff instructions just about eliminate any misplaced parts.

Construction is basic. You start with the resistors, add the capacitors, and semiconductors, and then install the frequency-dependent component. Since the kit can cover many bands, you must be sure you are looking at the correct section before stuffing these parts in. I almost goofed up and was about to install the parts for 80 meters when in fact I had the kit for 40 meters. No, you don't get the parts for all the other bands, but the instructions are printed in the manual to cover 80, 40, 30, and 20 meters. It's easy to get lost, so be careful when installing these parts.

Speaking of frequency-dependent components, you have to wind two toroids in this transceiver. It's not that Earth-shattering and the instructions are crystal clear. In fact, you don't even have to scrape the enamel off the wires. Vectronics uses a heat-strippable wire for the toroids. You simply heat the wire with your soldering iron and the insulation melts right off! Tin the wires with some solder, and stuff the toroids on the PC board.

During construction, there was nothing unusual that popped up. No surprises! The rest of construction is basically installing the various switches and jacks. The antenna jack is for an RCA-type plug.

The VXO capacitor is a 365 mF unit designed for broadcast radios. It's held in place with a hunk of double-sided tape. There are two ground wires that help hold the capacitor. Thank goodness that Vectronics included the most needed and the almost impossible to find — the adapter to fit a knob to the VXC capacitor!

Testing the Vectronics transceiver

All you need is a power supply capable of 12-14 volts at 500 mA and a dummy load

Continued on page 59

Number 46 on your Feedback card

Jack Heller KB7NO
P.O. Box 1792
Carson City NV 89702-1792
[jheller@sierra.net]

More Than You Can Shake a Digital Stick At

More new stuff coming at you these days than you can shake a stick at. I heard people talking about the DigiPan program for PSK31, and that sounded like a must-have. Or at least I didn't want to be left out in the dark at discussion time, so here goes.

I certainly have to agree with the premise that the program was developed for ease of use. It is that for sure. I downloaded it, opened it up, and looked for a manual. From the site where I downloaded, there was no sign of a manual as an extra file, nor did one show up after the unzipping process.

This program is about as user-friendly as they get. Having used other programs for PSK31, this was a snap to get up and running without any fancy written instructions. This is possibly an overstatement, because there is an adequate on-line answer man in the form of a well-written help file. And I spoke with at least one DigiPan user who swore that there is a manual and he printed and read it from front to back.

The program's claim to fame is that the user has a panoramic view of the section of the band showing every signal for at least 300 Hz across the bottom of the screen! I had heard of it, but had to see it to believe it. See **Fig. 1**.

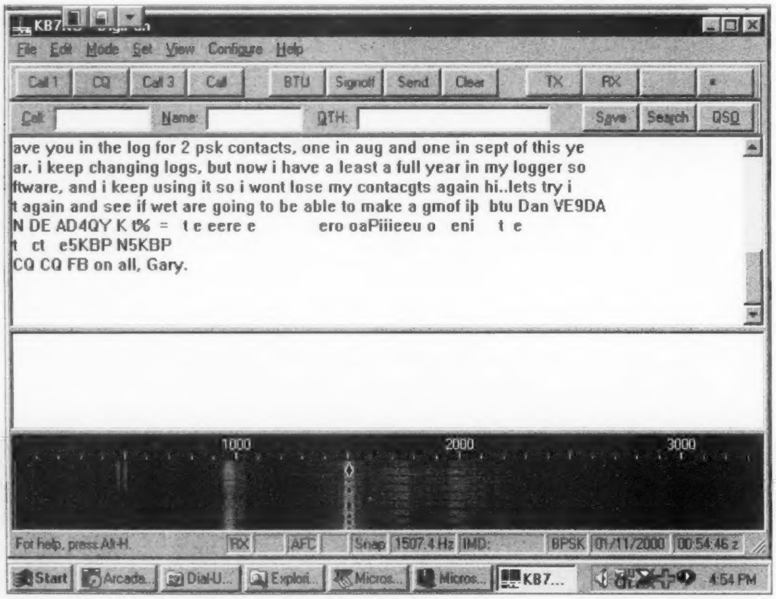

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Fig. 1. This is the DigiPan screen. How many signals are there? Study the wide spectrum waterfall at the bottom of the screen. The copy in the receive screen doesn't make sense as I was tuning from one to another of the several signals, all concurrently transmitting. At the far left, above the "Alt-H" is a nice clean signal just begun a few seconds prior to snapping this screen. The next two appear wide in the display, though they were better looking (narrow) on the screen. The next two are parts of the same PACTOR signal. Gives you an idea of the efficiency of the PSK31 signals, especially when you compare the throughput at similar S/N ratios. Also, note the diamond in the center of the spectrum. That is where the system is currently tuned. To go to another signal, you can simply click on the waterfall for that signal and you are there.

As you can see, the full width of the bottom section of the monitor image is a spectrum display. This pretty well covers the PSK31 window on 20 meters, so you can observe where the latest warble is located in relation to where you are tuned. If you look carefully for the diamond in the center of the display, that was where I was tuned at the time of the screen shot.

There are several interesting features connected to this portion of the program. One is that you can tune automatically to a different signal simply by clicking on that signal. The diamond moves to perfectly line up, and you begin a screen print of that signal. This means there is little need to twist the knob on the radio to work the entire window. The downside is that you never know exactly what the frequency of the signal is. This isn't a real problem, since you are not at a band edge, but it is a little disconcerting at first.

Another clever byproduct you will discover is that you can check the effectiveness of your filters. I discovered this as I adjusted the passband tune on the Icom 735 and watched the adjacent signals and other noise disappear as if by magic while I was listening to the effect. It's fun to play with. I talked to one ham with more optional filters than I have, and he had checked these in the same manner. I think he said he had a narrow CW filter he switched in.

There is a small controversy about methods of using the narrow CW filter some have in our rigs with the PSK31 programs. I tried it one day by switching to CW and tuning to an incoming signal. The copy was terrific, but the rig doesn't transmit PSK31 on the CW mode. When I went back to sideband, I was off frequency. This experiment, I believe, was using Logger, though the program makes no difference.

Another revelation with the DigiPan program is that you will see the RTTY and TOR signals that are close by, which will give you an appreciation for the narrow bandwidth of PSK31. I find that extremely loud adjacent signals of any form have a tendency to overload the system, and I lose copy in the PSK mode. I hear that is true from other hams. The only difference comes in the individual rig's ability to reject these signals.

Hence the need for filtering ahead of the audio section. Since the time of the experiment with the CW mode with the narrow filter, I have located a split frequency program that is purported to allow adjustment to automatically compensate for receiving one mode and transmitting the other. The installation and implementation appear to be causing undue stress in the thinking area. I will get back to it, and let you know when I get good results.

Another handy feature of the DigiPan program is its ease of logging. Though it wasn't developed as a logging program, you are able to record PSK31 QSOs and recall them to the screen. I didn't find any way to print the log, but, again, it is not a logging program.

I've had a few other learning incidents recently. I don't claim to be a contest type, but I find some of these ethereal get-togethers irresistible and give them a go. I find some of the results of my efforts amusing at best, but there are things to be learned from these activities.

As most of us realize, PSK31 doesn't work unless it is tuned precisely, and that is the reason for the AFC and the NET functions in the programs. I find it difficult to believe, but I have observed stations answering a CQ call a full 30 Hz off frequency. I wonder what they are thinking. Dead center doesn't seem close enough much of the time in those contests.

Tongue-in-cheek thought (no sour grapes intended!): I found that my peanut whistle PSK31 station seems to be copied quite easily as long as it is not contest time. I listened to and answered several stations' CQ Test and they seemed not to hear me at all. Watching other stations from my neck of the woods call the same contestors, I found that they weren't heard either. Perhaps, I surmised, the program doesn't "hear" well after a CQ Test sequence. As a test, I tried calling "CQ test" and it must be true: No one answered.

This last bit might be construed as sour grapes. Not so. The learning part is that the stations having success had, for the most part, clean signals, and they stood out as though they were running a hundred watts to an efficient antenna. I wasn't doing that. Plus, they very likely had a different bedlam factor for the incoming signals at their station. What is needed at this little whistle stop is a stronger presence if I wish to compete.

Which thoughts bring up a few points about producing a loud signal on PSK31. You will notice that an overdriven signal (audio level too high on transmit) is about two to three times "louder" than the same station is after the audio is adjusted correctly. So, some folks wonder, why not overdrive and be heard?

The reason is simply that the overdriven signal takes up a lot more spectrum than the properly adjusted signal. PSK31 should be 31.25 Hz wide. That's it. An overdriven signal, as you can observe with the display on DigiPan or Logger, may easily be five times that width, and I hear tell of signals worse than that. So the idea is to keep within the parameters intended for the program and you will be copied quite well "down in the mud." You will find that four or even five equally spaced, clean signals can coexist within a space of 200 Hz. You will observe this happening from time to time, believe it or not.

If you would like to have an audio "scope" program to observe signals all by itself, there is an excellent freebie program by Bob K4CY, the author of Logger. The URL for download is the same place as the Logger program (see **Table 1**).

See **Fig. 2** for a sample of the display. The display on your monitor does not cover the entire monitor screen, and has buttons for you to click for various functions. The functions are described in the caption. I noticed complaints that some folks were downloading the scope program and having problems. So I waited a week or two until it had been tweaked a bit, and the program loaded and ran like a charm. Apparently, some computers accepted the configuration and some did not. It is highly unlikely that you will experience a problem with the program by the time this article reaches you.

Speaking of Logger, the updates keep coming. At the time of this writing, the latest version is v7.01. Bob just keeps adding on new features. The latest is to allow a recording and playback to the other station of his signal. At this writing, I have not made the install and tried the new addition.

I have fallen into the clutches of the logging abilities of the program. The PSK31 with the spectral display is great. I enjoy

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Table 1. *The infamous chart of everything you ever wanted …*

that part, and probably would not have gotten the program if that wasn't included. Now that I have it up and working and fairly well understand the logging part, I wouldn't want to be without it.

More new stuff. I have mentioned the Hellschreiber and MT63 programs from IZ8BLY earlier and left URLs last month. Finally, I bit the bullet and downloaded the files. What a blast! (Note the URL in **Table 1**.)

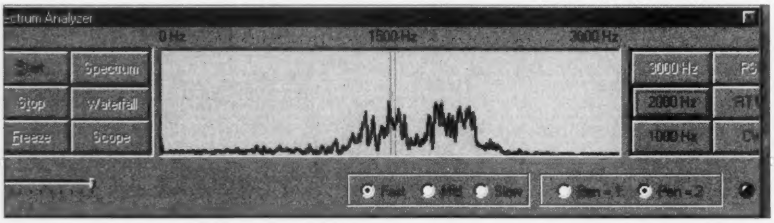

Fig. 2. *This is the display you will see with the scope program from Bob Furzer. The signal is frozen in the spectrum mode on an SSTV signal. This leaves only one of the buttons at the left readable. In addition to the start button, there are choices of Spectrum, Waterfall and Scope display. The other two buttons are Freeze and Stop. The program gets its samples from your computer sound card, so you use the same set up as for digital sound card communication programs.*

Hellschreiber, as you may know, is a resurrection of an old mode developed by the Germans in the 1920s. It was, I am sure, only used on landline service to transfer hard copy from one station to another. They had portable field units. A picture of one is available on the Web site, where you can learn all about this forerunner of the facsimile mode.

What is fun is running it under Windows95 through your sound card, with the same setup you would use for PSK31. The action seems to be primarily around the 14.063 MHz area. At first I had a bit of a problem with the relatively simple configuration to make the received message readable. Then I discovered the pull-down under "Receive" had a "bias" adjustment. A little tweaking there, and most signals are nearly perfect print.

There are not a lot of hams involved in what is referred to as the "Fuzzy" mode, but anyone doing Hell is having a ball. There are a lot more options in the Windows program than the German designer ever imagined. One big advantage is selective fonts. Angelo W8ERN has it pretty well figured out, so his signals are very readable.

He is using one of the more straightforward fonts in the bold mode and they really stand out when they hit your monitor. The throughput is not exactly in the robust category. You will not have a problem keeping up as you type your messages. I haven't timed the rate, but it is under 10 words per minute. Kind of nice. Lots of time to correct your errors before anyone sees them.

It didn't seem like there was much activity, until one Saturday when I decided to show the wife the strange print on the screen. There was only the slightest hint of a signal out there, so I sent a CQ to show what the fonts looked like on the monitor. There was action. I got a response from Tom KA7W in New Mexico — he was having trouble with copy due to the QRM from signals to the east that I was barely aware of.

We did a few turnarounds and he mentioned switching to MT63. The previous day, Tom had been my second MT63 QSO and I was his first. That may sound like two blind people groping in the dark. However, the software, though it does have a different operating scheme, is quite user-friendly and your first experiences will very likely go as mine did, without hardly a hitch.

The MT63 software does require a fairly fast computer. My 120 MHz Pentium with 32 megs of RAM is adequate, but apparently just barely. Tom was having a problem with a similar setup, maybe a tad slower, in that the tuning display (another

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Advanced AO-27 Techniques

Last month, we investigated the basics of making contacts via the FM crossband repeater in the sky, AMRAD-OSCAR-27. OSCAR is an acronym for Orbiting Satellite Carrying Amateur Radio. We showed how to get started with only a typical dual-band handie-talkie and standard whip antennas. This time, we'll take a look at some advanced AO-27 techniques and gear.

There is a growing number of hams who have taken satellite activity away from the home station and literally hit the road with portable stations that they can use at a moment's notice. Their reasons for this effort vary. Some can't put up outside antennas at home due to deed restrictions or other physical constraints. Others have work schedules that preclude being at home, awake, and available for satellite passes. Either way, putting together and using a portable or mobile hamsat station can be a perfect solution, and it's a challenge.

Those who have made satellite contacts while mobile or portable have learned a great deal in the process. First, they had to find a radio that could do the job. Then an appropriate antenna was needed. Orbital predictions for their location were required. Finally, these enthusiasts had to put it all together, make a few mistakes, and master the process.

A-O-27 Boston MA 4-2000				A-O-27 Houston TX 4-2000				A-O-27 Los Angeles 4-2000			
Date	TCA	EL+AZ	Orbit	Date	TCA	EL+AZ	Orbit	Date	TCA	EL+AZ	Orbit
01Apr	14:54	75-W	33955	01Apr	16:38	46-W	33957	01Apr	18:17	42-W	33958
02Apr	14:26	62-E	33970	02Apr	16:11	89-W	33971	02Apr	17:50	81-W	33972
03Apr	13:59	34-E	33984	03Apr	15:44	46-E	33985	03Apr	17:23	53-E	33986
04Apr	15:12	51-W	33999	04Apr	16:56	30-W	34000	04Apr	18:35	28-W	34001
05Apr	14:45	89-W	34013	05Apr	16:29	57-W	34014	05Apr	18:08	52-W	34015
06Apr	14:17	51-E	34027	06Apr	16:02	73-E	34028	06Apr	17:41	83-E	34029
07Apr	15:30	35-W	34042	07Apr	15:34	37-E	34042	07Apr	17:14	43-E	34043
08Apr	15:03	62-W	34056	08Apr	16:47	37-W	34057	08Apr	18:26	34-W	34058
09Apr	14:35	76-E	34070	09Apr	16:20	72-W	34071	09Apr	17:59	64-W	34072
10Apr	14:08	42-E	34084	10Apr	15:53	59-E	34085	10Apr	17:32	67-E	34086
11Apr	15:21	42-W	34099	11Apr	15:25	30-E	34099	11Apr	17:05	35-E	34100
12Apr	14:54	74-W	34113	12Apr	16:38	45-W	34114	12Apr	18:17	42-W	34115
13Apr	14:26	63-E	34127	13Apr	16:11	88-W	34128	13Apr	17:50	79-W	34129
14Apr	13:59	35-E	34141	14Apr	15:43	47-E	34142	14Apr	17:23	54-E	34143
15Apr	15:12	51-W	34156	15Apr	16:56	29-W	34157	15Apr	16:56	29-E	34157
16Apr	14:45	88-W	34170	16Apr	16:29	56-W	34171	16Apr	18:08	51-W	34172
17Apr	14:17	52-E	34184	17Apr	16:02	75-E	34185	17Apr	17:41	84-E	34186
18Apr	15:30	35-W	34199	18Apr	15:35	38-E	34199	18Apr	17:14	44-E	34200
19Apr	15:03	61-W	34213	19Apr	16:47	36-W	34214	19Apr	18:26	34-W	34215
20Apr	14:35	77-E	34227	20Apr	16:20	70-W	34228	20Apr	17:59	63-W	34229
21Apr	14:08	43-E	34241	21Apr	15:53	60-E	34242	21Apr	17:32	69-E	34243
22Apr	15:21	42-W	34256	22Apr	15:26	30-E	34256	22Apr	17:05	36-E	34257
23Apr	14:53	73-W	34270	23Apr	16:38	45-W	34271	23Apr	18:17	41-W	34272
24Apr	14:26	64-E	34284	24Apr	16:11	87-W	34285	24Apr	17:50	78-W	34286
25Apr	13:59	36-E	34298	25Apr	15:44	48-E	34299	25Apr	17:23	55-E	34300
26Apr	15:12	50-W	34313	26Apr	16:56	29-W	34314	26Apr	16:56	29-E	34314
27Apr	14:44	87-W	34327	27Apr	16:29	56-W	34328	27Apr	18:08	51-W	34329
28Apr	14:17	53-E	34341	28Apr	16:02	76-E	34342	28Apr	17:41	85-E	34343
29Apr	15:29	35-W	34356	29Apr	15:35	38-E	34356	29Apr	17:14	45-E	34357
30Apr	15:02	60-W	34370	30Apr	16:47	36-W	34371	30Apr	18:26	33-W	34372

***Table 1.** April 2000 tracking data for AO-27.*

The perfect HT

A common question among satellite newcomers is, "I want to get a new handie-talkie. What are the best HTs for satellite work via AO-27 and Sunsat-OSCAR-35?" Fortunately, there are many HTs that will do the job, but the "best" radios to use for single-channel FM hamsats like AO-27 and SO-35 have important features that set them apart from the others.

The perfect HT would be easy to use, operational on the satellite bands without modification, capable of full duplex on two meters and 70 cm, have a sensitive receiver, and at least five watts output power. My older Alinco DJ-580T satisfied all the wish-list items except the one about modifications. A wire inside the radio had to be cut in order to operate below 440 MHz.

If you do not already have an HT, consider the above criteria before buying. Some of the more successful and active AO-27 road warriors prefer specific Kenwood and Yaesu HTs. There are others that will do the job.

On the Kenwood side, the TH-D7A is a favorite even though it is a bit cumbersome for typical hamsat voice operation. This expensive dual-bander has a built-in 1200/9600-baud Terminal Node Controller (TNC) and can be used for APRS, in addition to normal packet and voice. The TH-D7A is a truly amazing radio. Most HTs have connections for an external speaker/mike, while this one has additional connections for a GPS receiver and computer serial port. A close second, without the digital capabilities, is the TH-79KSS. It's compact, lightweight, sensitive, has five watts of output power, and has plenty of memories to set up for satellite operation.

The FT-51R/HP from Yaesu is another high-performance HT preferred by many FM-hamsat chasers. It's very easy to use, has all the features needed for full-duplex satellite work, and is reasonably priced.

From Alinco, the DJ-G5TH has seen some good prices from the major amateur radio stores like Ham Radio Outlet and Amateur Electronic Supply. This full-duplex dual-bander has more than five watts out when powered from a 13.8 VDC source. Operation is easy and effective.

The perfect antenna

Build it or buy it. When Arrow Antenna came out with their hand-held, portable, dual-band satellite beam, a lot of antenna builders got out their checkbooks. It's fun to build and experiment with home antennas, but there are other issues that have made the Arrow Antenna number one among serious portable operators.

While a long HT whip antenna like the MFJ-1712 or MFJ-1717 often does well, many of the "pros" travel to remote grid squares to provide contacts for those in pursuit of the VUCC (VHF/UHF Century Club) award from the American Radio Relay League. These folks must have good uplink and downlink capability throughout any satellite passes that come over the horizon. A beam is required.

Early portable work was done with anything that would work, from dipoles and whips to full beam arrays, complete with rotors. The inconvenience meant that only a few hams even tried truly portable hamsat operation.

Single-channel FM satellites and dual-band HTs go well together. With the addition of a simple dual-band, beam it gets even better. The Arrow II from Arrow Antenna [http://members.aol.com/arrow146/index.html] in Cheyenne WY, is not cheap, but it has all the features that make it the perfect portable two meter and 70 cm satellite antenna. It's light (only 19 oz.), comes pretuned for the satellite subbands, is easy to put together or break down, packs small, and is available with an optional split boom and built-in 10-watt duplexer. The elements are made from aluminum arrow shafts. The base model is $73. With duplexer and split boom, it's up to $139.

The first time I put together an Arrow II, it took ten minutes. It has seven elements on 70 cm and three on two meters. The boom is in two pieces for compact shipping and packing and the instruction manual provides excellent drawings. The assembly notes are minimal, but quite sufficient: "Attach the elements to the boom as shown above, by screwing the elements together through the holes in the boom. Attach feedlines to the BNC connectors. That's it. The antenna is pretuned and ready to go." After the first time putting the Arrow II together, now it only takes me about three minutes from the bag to on-the-air.

On the air

Last month, I provided a chart of orbits for March. A chart for the best pass of each day in April can be seen in **Table 1**. The data was made with Silicon

***Photo A.** The Arrow II antenna with two-piece boom and built-in duplexer.*

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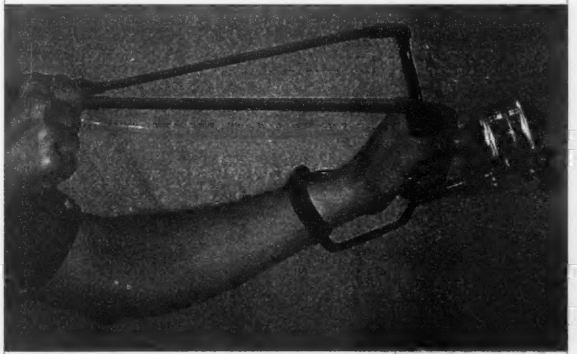

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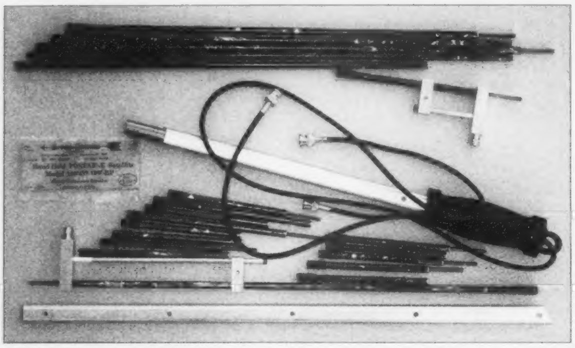

Photo B. The Arrow II has a lot of parts, but they're well made and easy to assemble.

Photo D. Jerry K5OE with his Arrow and HT, making AO-27 and SO-35 contacts during a day trip through rare grid squares in South Texas.

Solutions' [site — http://www.rcallen.com] GrafTrack Rev. 4.01. Pick a location that has a similar longitude to yours. For example, if you live in San Francisco, use the Los Angeles data. On April 1, orbit 33958 will be at the Time of Closest Approach (TCA) at 18:17 UTC or 10:17 PST for Los Angeles. AO-27 will be at 42 degrees elevation to the west. For an observer in San Francisco, this TCA will occur a few minutes earlier.

You can hear the satellite about seven minutes before and after TCA. All orbits are descending. That means that the satellite is traveling from the north to the south. Remember to adjust for Doppler shift. While the downlink is on 436.791 MHz, it will appear as much as 10 kHz high at the beginning of the pass, and 10 kHz low at the end. The AO-27 uplink on 145.850 MHz requires less, if any, correction since the Doppler at two meters is only one-third that at 70 cm.

When using a dual-band beam like the Arrow, a speaker/mike is not necessary, but earphones or earbuds are. It's quite embarrassing to be the originator of feedback via satellite.

The antennas on the satellite are changing their apparent polarization with respect to you during a pass. When using a beam, you should use the data from **Table 1** or your own computer predictions. Simply knowing the direction and elevation to the satellite at one point in time (the Time of Closest Approach or TCA) is enough to use a hand-held beam. Since all operational passes are descending, you will know that the satellite is coming out of the north, and then traveling to your east or west, per the chart. After TCA, the satellite will be going south.

It takes some practice to keep up with AO-27 as it streaks from horizon to horizon, but the advantage of a hand-held beam becomes quickly apparent. Not only will you have a stronger downlink, but your uplink on two meters will improve, and you will almost unconsciously compensate for tracking due to the natural pursuit of the best received signal and subsequent almost automatic maneuvering of the beam antenna.

Check out last month's column for more details on the mechanics of AO-27 chasing. Investigate information from AMSAT, The Radio Amateur Satellite Corporation [http://www.amsat.org]. Try a few passes! I'll have my Arrow II in the car on weekdays in April looking for contacts, but if you don't hear me, there are plenty of regulars waiting to be your first hamsat QSO.

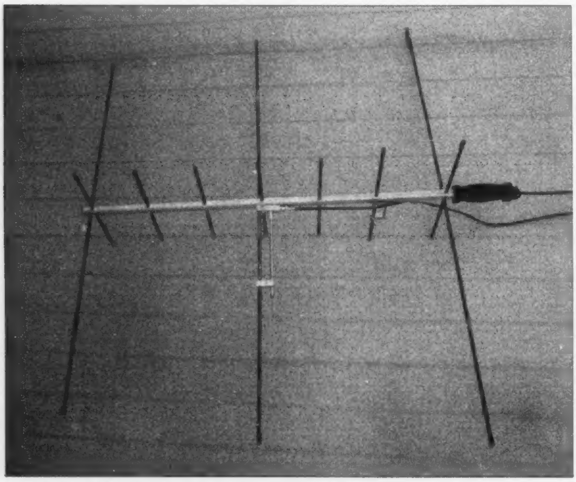

Photo C. After only a few minutes, the bag of parts turns into a very effective hamsat antenna.

Another challenge

While it's easy to predict operation via AO-27, the same is not true for Sunsat-OSCAR-35 [http://www.sunsat.ee.sun.ac.za/main.htm]. However, the chase of this more elusive satellite is well worth the effort. SO-35, from South Africa, can be programmed to operate in several VHF/UHF configurations. The favorite has been as a single-channel FM repeater using 70 cm up (436.291 MHz) and two meters down (145.825 MHz). This is the opposite of AO-27.

The strength of the two-meter downlink is spectacular. I have heard this satellite with my HT while the Arrow II was on the ground, aimed in the wrong direction. My inexpensive desktop scanner, with only the built-in whip antenna, also does a nice job receiving SO-35. See if you can figure out the uplink and downlink Doppler effect for this frequency configuration.

The satellite is normally only active on ham frequencies over the U.S. for a few passes per weekend. The best way to keep up with the operating schedule, and to get up-to-date satellite information, is to check the Sunsat Web page shown above. Schedule changes to accommodate onboard experiments are common.

Next time, we'll look at the beginning of your home Earth station for satellite chasing, and other new and exciting repeaters in the sky.

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The Voice of DXers

To those who have been thinking about offering material to be published here in this column, I say, "What are you waiting for?" I am eager to receive text, art, and photos from around the world of DX. Don't be bashful, especially if you are reporting on DXpedition activities, or anecdotes and human interest features that pertain to our hobby. All nutritional success testimonies should go directly to Wayne, however.

If you have material of a timely nature, such as announcements of upcoming contests or DXpeditions, you should be aware that the typical production cycle for this magazine has a built-in time delay of a few months. For example, if you were to submit material in the first week of April, my deadline for the inclusion of that material will be April 15th. Assuming I have submitted the draft of my column to *73* on time, it won't appear in print until the July issue. That works out to roughly a three-month gestation period for the columns and features that appear in the magazine.

I should mention that if you have items of a more immediate nature, you should send them to someone like Bernie W3UR, who publishes the Daily DX on the Internet, or to one of the DX bulletin services like that of the ARRL. If you have access to the Internet, you can send information to Bernie at: [bernie@dailydx.com]. I can say with confidence that between the two of us there is no consideration of competition when it comes to the necessity of getting timely information out to all of you.

Hospitality — Seattle-style

In late January, the hams of Seattle WA, were called upon to meet an urgent diplomatic need. Ms. Deborah Kuznitz, Director of Special Programs for Global Education Services, became aware that a foreign dignitary from an Eastern European nation was attending an economic conference here in Seattle (not WTO, thank God!), and wanted to meet with local hams. Hams?! As it turns out, the dignitary was the Honorable Nikolaj Entchev LZ1FL, Mayor of Karlovo, Bulgaria.

To make a long story short, former ARRL Northwest Division Director Mary Lewis W7QGP learned of this situation, and mobilized the social arm of the Western Washington DX Club. She and her husband, Harry W7JWJ (ARRL Western Washington Section Manager), Dick K7BTW, and others got the word out to the general ham community, and pulled together a nice reception at a local Seattle restaurant just prior to Nick's departure.

His Honor shared some interesting stories concerning DX and contesting in his hometown at the gathering. As it turns out, the USA is not the only place where TVI is a problem. One of the ways they get around it in Bulgaria is to have a big-gun club station away from town (in this case, LZ7G), where they can "turn up the volume," and rack up some impressive scores. See **Photo A.**

WWDXC members Mike Hansow KA7CSE and Mike Dinkelman N7WA, who also represent the Seattle area's Mike & Key Club (K7LED), were on hand to give Nick something to take back with him. As it turns out, humor found its way onto the agenda. Mike N7WA recalls that, "As a representative of the Mike & Key ARC, I presented him with a T-shirt and member pin from the club. I did err on the side of caution and got him an extra-large shirt, which probably comes down to his knees." From the look on everyone's face (see photo) it looks like a good time was had by all. I wish I hadn't been elsewhere and missed it.

Congratulations to all who participated in making Nick's visit a memorable one. By the way, I just want to know one thing: Did he also go home with a generous portion of Portlock Salmon under his arm?

And now the news

To start with, here are a couple of items

Continued on page 54

Photo A. *From left to right: former ARRL NW Div. Dir. Mary Lewis W7QGP, Mike Dinkelman N7WA, The Hon. Mayor Nikolaj Entchev LZ1FL, and ARRL WWA SM Harry Lewis W7JWJ (N7WA photo).*

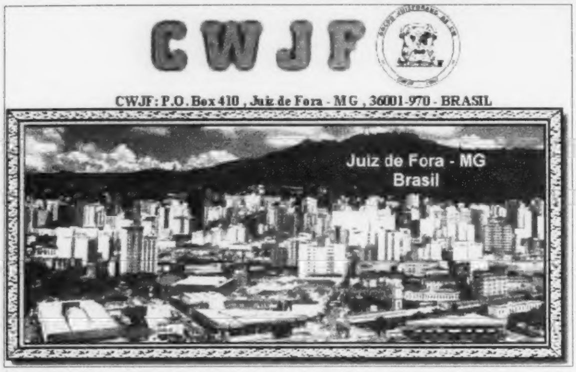

Photo B. The CWJF Award is issued by the "Juiz de Fora CW Group" of Brazil.

THE DX FORUM

continued from page 53

courtesy of the New Jersey DX Association DX reflector on the Internet.

From Mark DL9RCF, "Dear friends, just a very short information. 4U1UN via: United Nations Amateur Radio Station, P.O. BOX 3873, New York NY 10017, USA, seems to work … got my card within only a few days … good DX to everyone."

From Dieter XE1D, "Hi to all. Anybody who did not receive his QSL card from XF4MX, pls contact the following E-mail address for a fast reply: [llibin@tecemp.mor.itesm.mx], or [7233377@mcimail.com]."

At the time of writing, the highly successful XZ0A DXpedition had just concluded. Just in case you are interested in some of the statistics, or would like to search the log to see if you are there, point your browser to the following URLs: [www.getnet.com/~k7wx/xz0alog.htm], or [www.getnet.com/~k7wx/myanmar.htm].

And from Bernie at The Daily DX comes a brief summary of some notable DX stations that will be active in the month of April: 9U5D (via SM0BFJ), VP6BR (via OH2BR), VK0MM, XW2A.

From the Redmond Top Key Contest Club comes a note written by Atsushi JR1NKN/W7:

"Dear topbanders,

JA's government has announced that 1810–1825 kHz would be added to JA's 160m band, starting April 1st. Your strategy might be changed."

Stay tuned for further details on this story. If you are interested in a list of top-band allocations around the globe, check out the list put together by K0CKD at [www.topband.net/topban2000.txt].

Tito LU7EE, who is one of our friends in the Grupo Argentino de Radiotelegrafia (GACW; loosely translated: Argentine CW Group), informs us of a couple of nice awards that may be obtained by working members of the Juiz de Fora CW Group in Brazil. I understand that they are nice awards (see **Photo B**), and are recommended to all those who desire to promote CW in the "post license deflation era" ushered in by the FCC. Here are the details:

CWJF Award

Issued by "Juiz de Fora CW Group" to all amateurs who have worked three different CWJF members. Contacts are valid on any band after May 1, 1985. Only two-way CW mode. Do not send QSL cards, only GRC. Fee: 6 IRCs. The award is also available to SWLs under the same conditions.

DCJF Award

Issued by " Juiz de Fora CW Group." The award is available to all licensed amateurs and SWLs who have confirmed contacts with:

(a) South American stations using any suffix letters from the phrase JUIZ DE FORA — A MANCHESTER MINEIRA.

b) Three different CWJF members.

Contacts can be in any band, only two-way CW mode, after May 1, 1985. Do not send QSL cards, only GCR. Fee: 6 IRCs. Applications and requests for further information may be addressed to CWJF: P.O. Box 410, 36001-970 Juiz de Fora — MG, Brazil.

For the benefit of those of you who do not have access to the Internet, here is a list of Juiz de Fora stations (as of Oct., '99): PY4CEL (Treas.), PY4CY, PY4EM (Secretary), PY4HJ, PY4KL, PY4VB (Vice Pres.), PY4VG, PY4WAS (Pres.), PY4WQN, PY4YN.

For a comprehensive list of CWJF Members, point your browser to: [www.powerline.com.br/cwjf].

Just listening — an emphasis on the joy of SWLing

I don't have much to report in the SWL arena this month, so stay tuned, HI. Some folks asked me what happened to my monthly radio program on HCJB. (See **Photo C**.) Well, to make a long story short, I agonized over the future value of my efforts with HCJB, and concluded that I needed to consolidate some of my activities, and make better economy of my time. Hence, I pulled the plug on "Tech Talk with Dr. Rick" with the intention of devoting more time and effort in support of *73* Magazine.

Back when Allen Graham and I were first trying to come up with a name for

Continued on page 60

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Photo C. I pulled the plug on "Tech Talk with Dr. Rick" with the intention of devoting more time and effort to support of 73 Magazine.

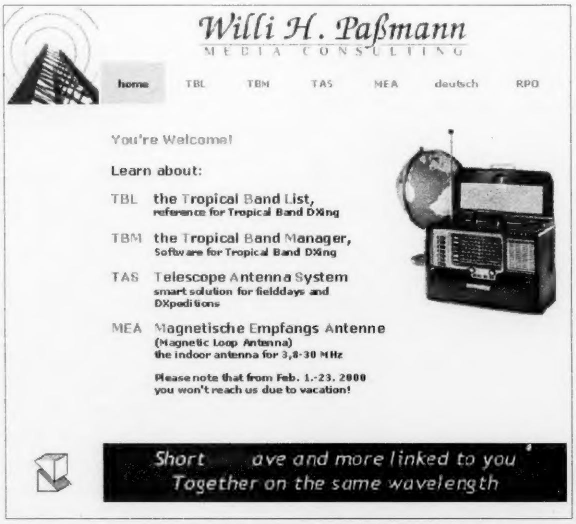

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Photo D. You're invited to check out Willi Passmann's Web page.

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Installing Your Mobile Rig

Are you new to the hobby and nervous about installing a two meter rig? Maybe you are an experienced ham who hasn't yet taken the plunge into mobile HF operations. Put away your worry beads and break out the toolbox, because installing a mobile rig is a lot easier than you may think. There are really only three components with which you must be concerned. There's the radio itself, the power source, and the antenna. That's it! So with that frame of mind, let's take a look at how to install a mobile rig.

Perhaps you've just picked out your dream radio, or maybe you've come back from a hamfest with a more experienced radio that will meet all your hamming needs. In either case, the first step is to pick an appropriate location in which to install it. For most of us, this will be a fairly easy decision, since we will want a location in which the radio will fit and will be conveniently located for the driver of the vehicle.

The first decision we need to make is whether the radio is going to be a permanent or a temporary installation. A temporary installation makes it convenient to move the radio so that it can be used elsewhere, or stored in the trunk when the car is parked to minimize the chance of theft. It's a good idea to check your insurance policy before installing the radio. Some policies will only cover the radio if it is permanently mounted in the vehicle, while other policies will not cover ham equipment, so it is a safer bet to lock the radio in the trunk.

A proper installation should not present a threat to the occupants of the car in the event of an accident. Anything inside the car that is not anchored has the risk of breaking free and becoming a missile that can travel through the interior of the car at a high rate of speed. A proper mount ensures that the radio will stay put even in the event of a collision or sudden stop. Naturally, you should also make sure that the location is such that people inside the car do not collide with the radio. A radio mounted at knee level immediately in front of the driver can have serious consequences in the event of a sudden stop. Both permanent and temporary mounts can and should keep the radio secure.

Ensure that the radio is easy to operate without distracting the driver from his or her primary responsibility of controlling the car. The display should be easily readable from the driver's position. It is important to check not only for visibility of the display but also to avoid glare that might interfere with the display. With VHF and UHF operations, there is not a lot of tuning required, so front panel access is sporadic and brief. For low band operation, more tuning is required, as well as access to other features, so the location of the main controls will be more critical. If a lot of control manipulation is expected, the rig should be located so that the hand can rest on the seat or armrest and reach the controls without holding the arm extended. This will eliminate unnecessary fatigue.

The two most common locations for permanently mounting a radio in an automobile without a center console are under the dashboard or on the floor. Under-dash mounting works best for smaller-size rigs such as VHF radios, and provides a location

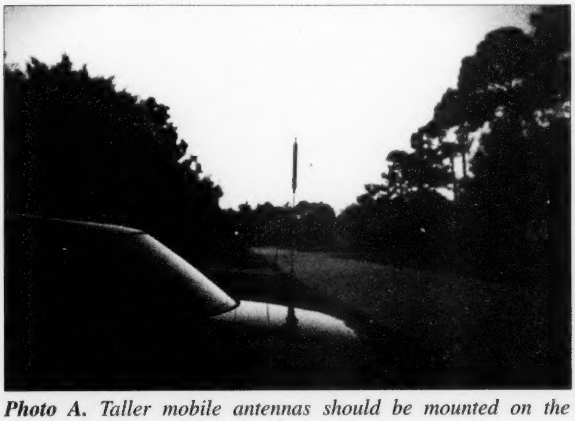

Photo A. *Taller mobile antennas should be mounted on the driver's side to better clear tree limbs hanging over the road.*

Photo B. *On-glass mount antennas have benefited from technology developed by the cellular telephone industry, and work well for VHF and UHF applications.*

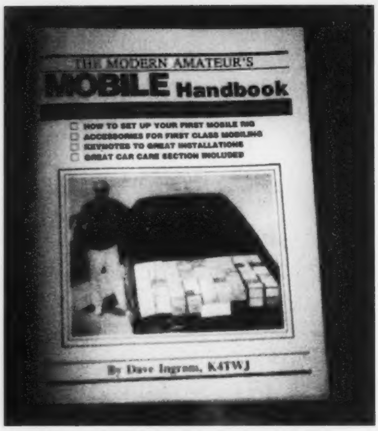
THE MODERN AMATEUR'S
MOBILE Handbook
☐ HOW TO SET UP YOUR FIRST MOBILE RIG
☐ ACCESSORIES FOR FIRST CLASS MOBILING
☐ KEYNOTES TO GREAT INSTALLATIONS
☐ GREAT CAR CARE SECTION INCLUDED
By Dave Ingram, K4TWJ

***Photo C.** There are many good books on mobile operations, such as this one from MFJ Enterprises.*

that is both attractive and convenient. For pickup trucks and some suburban utility vehicles, there may be ample space; however, in many cars space is limited and so may be your options. If you wish to mount your rig under the dash and it appears that there is not enough space, you may be able to clear up enough room by removing the ashtray. This can give the rig more of an integrated appearance. Likewise, some cars have a shelf below the broadcast band radio that may provide a suitable mounting location.

In-dash or under-dash locations are convenient, but may present a few mechanical problems. Modern vehicles use plastics extensively, so the old method of mounting a radio to the bottom of the dashboard with a couple of sheet metal screws may not work. What will work in many cases is to install large washers or a piece of sheet metal both above and below the mounting surface. Generally, it is easiest to install the radio's mounting bracket under the dash first, and then to mount the radio into the bracket.

If the dashboard is plastic, it will not provide a ground for the radio. This means that the ground to the radio will be provided through the negative power lead and/or the outer braid of the antenna coax, which is not optimal. If your radio requires a proper electrical ground, you'll need to install a connection from the radio to a good ground in the vehicle. For most VHF or UHF radios this is not required, but check your radio's manual to determine what the grounding requirements are.

A floor mount is practical when a larger radio is to be installed — particularly a high frequency radio. The dashboard may not provide sufficient strength to support a heavy radio, and a floor mount does provide for a more comfortable position for the arm while tuning. In addition, if several radios are going to be installed, they can be stacked on top of one another without sacrificing stability. There are mounts available with multiple shelves so that several radios can be mounted with each in its own space.

On the other hand, there are angle brackets available at many radio stores that allow a single radio to straddle the hump on the center of the floor. While these can be used for a nonpermanent mount, I prefer to anchor the brackets to the floor with sheet metal screws. If possible, check to make sure that there are no wires running under the carpet in the location you have chosen before drilling holes. Don't be surprised if it takes a 3-inch sheet metal screw to ensure a good, firm grip, because it is easy to have quite an angle between the bracket and the floor.

Of course, radios can be installed in a temporary fashion. The hump mount brackets mentioned above are one possibility, but there are a number of others. I have seen radios mounted on a bean bag mount which readily will conform to the floor hump and provide a stable location during normal driving. Both these methods generally imitate a standard floor mounting of the radio. While it may seem that an under-dash location does not lend itself to a temporary arrangement, some mounting brackets have hardware that can be removed without tools. The radio can be mounted to the bracket with knurled knobs or wing bolts that can be removed relatively easily.

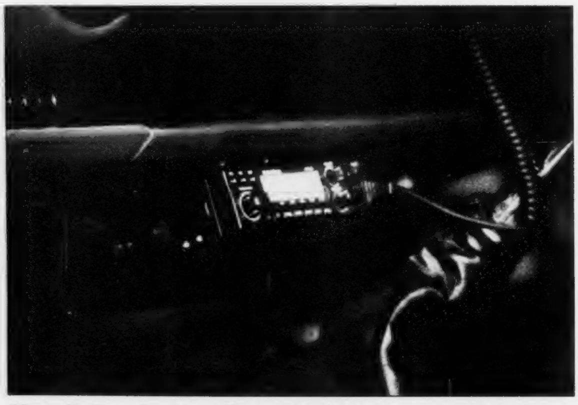

***Photo D.** Your final installation should be easy to reach and see.*

There are also brackets that allow the radio to be slid in and out of its location. These may include electrical connections that automatically connect the radio to power and the antenna when the radio is slid into its location. Personally, I prefer a more robust antenna connection, especially for 6 meters and lower. Since most radios only require a power and antenna connection, I prefer to connect and disconnect these directly rather than through a mount.

Another interesting method of mounting a radio is to use bungee cords. In this way a radio can be mounted vertically against the front of the seat so that the display is facing up. In some cases, such as when there is a center console, this is an ideal location. It may be necessary to devise some type of spacer to keep the heatsink on the back of the radio clear and prevent kinking of the cables. Make sure that the cords are tight enough to keep the radio secure. For smaller radios, heavy-duty Velcro fasteners can be used, particularly for mounting to a vertical surface. The most secure version of this had Velcro between the radio and the surface, and Velcro straps over the top.

Power

The power connection for the mobile radio is fairly straightforward. Most mobile rigs come packaged with power cords that have an adequate current rating. Since the manufacturer knows the rig's requirements, this is usually the easiest approach. If you are running your own power cable, make sure that the cable is able to handle the required current. Too small a wire can lead to poor performance at best and a fire hazard at the worst. If you have a long run, it is often more practical to run two wires in parallel for the positive and two in parallel for the negative rather than a single larger gauge wire. Obviously, the shorter the power cable, the smaller the gauge required.

It's tempting to connect the radio to the fuse block or the cigarette lighter. Although this may work for a low output rig, many radios put out 25 to 100 watts. The best course of action is to connect the radio power cable directly to the battery. If you are one of those people who forget to power off the radio when leaving the car, the radio can be made to switch off with the ignition. The best and safest way to do this is to use a relay (see **Fig. 2**). The other big argument that hams love to have is whether to put a fuse in both the positive and negative leads,

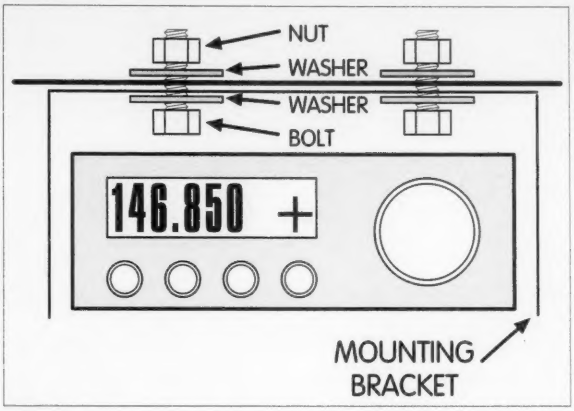

Fig. 1. *Using large washers or a piece of sheet metal to distribute the weight of the radio can make it possible to mount a small radio to the underside of a plastic dashboard.*

or only in the positive one. The best advice I've seen is to fuse both wires near the battery.

Antenna

There are many choices for antennas, and with as significant a difference as antennas can make, it is a choice worthy of careful thought. Magnetic-mount antennas are easy to install, but they tend to provide marginal operation. The base of the magnet provides a capacitance coupling to the car body that acts as the counterpoise for the antenna. While a magnet mount is great for use on rental cars while traveling, and better than a rubber ducky antenna inside the car, it is not the optimal antenna for mobile operations. Many cars have so much plastic and aluminum that you may have difficulty even finding a spot where the magnet will stick.

On-glass antennas are popular, reasonably priced, and easy to install. In most cases they will only be suitable for VHF frequencies or higher, although I have seen one which could be used for ten meters. These antennas use a capacitive coupling to connect the antenna on the outside of the glass with the mounting block on the inside of the glass. The glass itself acts as the dielectric between the conductors.

A few years ago, many of these antennas had problems because auto manufacturers had begun to use metal-based tinting in the windows. This prevented a proper coupling. During the early to mid-1990s, the cellular industry worked out many of these problems, and the on-glass antennas available today seem to work very well. Read the manufacturer's recommendation for temperature range, etc., before beginning, and plan on letting the car sit for an hour or so before heading out at highway speeds.

When installing an on-glass antenna, I recommend assembling the antenna and placing it in position using duct tape. It's easiest to mount the inside block first, usually near the top center of the rear window. After it is secure, mount the exterior portion of the antenna with duct tape as well. Make sure that the antenna is as close to vertical as possible, and then check the SWR. If you are able to adjust the SWR to an acceptable range, then it's safe to mount the antenna permanently.

Remove the external section and mark the window with an alcohol-based "permanent" felt tip marker. Then remove the internal portion and clean the window with isopropyl (rubbing) alcohol. Don't use window cleaner, as this contains silicone that will prevent the adhesive from sticking. Use the markings to line up the internal mounting block. Be as careful and precise as you can — once you press the block into place, you won't be able to move it. Next, clean the exterior of the window with alcohol and line up the external block (with the antenna pointed up, of course). Snake the cable under the headliner, and then to the radio location. Cable can be readily concealed under the carpet, along the molding of car doors and under seats.

While a ball-mount antenna is the most durable of antenna installations, many people are not anxious to drill multiple holes into a new car. For this reason, a number of mounts have been developed that do not require major surgery on the car body. Trunk lip mounts are a favorite, and there are a number of outstanding examples that use an SO-239 fitting to mate with a PL-259 antenna. While there are many 2 meter and 440 MHz antennas available with PL-259 fittings, there are also a fair number of HF antennas configured the same way.

For HF, there are also many antennas that have a 3/8" threaded fitting on the end. These tend to include those antennas that are longer or have a higher wind resistance. Three-eighths-inch mounts include the ball mounts that can be mounted through the fender, through the trunk mounts and various mounts that can be attached to the underbody of the automobile, bumpers, or trailer hitches. The advantage is that with these mounts you can often get more antenna onto the car, although it will often be mounted lower.

Since the antenna uses the car body for its counterpoise, some effectiveness may be lost with a bumper or other low mount, but the overall performance of a larger antenna should still be worth the effort. Don't forget that any of the connections exposed to the elements should be sealed with moldable coax seal or a silicone rubber sealant.

Whatever type of antenna you use, especially for high frequencies, there are a few realities with modern automobiles that need to be considered. First, as mentioned earlier, modern automobiles have more plastic and less steel. Second, the parts of an automobile are painted prior to assembly, so although the pieces may fit together well mechanically, often the individual pieces are electrically insulated from one another. Third, when cars were built on a frame, the frame acted as a single buss to which everything was electrically connected. Most of today's cars are no longer assembled on a frame, so the panels are not connected to a common point. Each of these factors will decrease the effectiveness of the car body as a ground plane or counterpoise and may add noise to the received signal.

Because of this, it is often necessary and almost always advisable to ensure that the various panels of the car are properly connected. I find that the braid from RG-8U

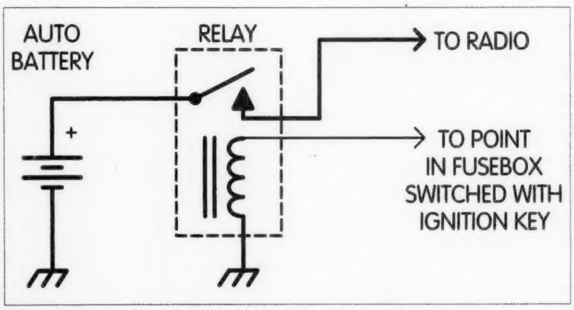

Fig. 2. *A relay can be used to switch off a mobile radio whenever the ignition is turned off. Make sure you use a relay that can handle the current required by your radio.*

coax makes an inexpensive yet effective connecting strap. I'll remove the braid from a used piece of coax, making sure that it is not corroded, flatten it and cut to length. I'll then use an ice pick or awl to spread the coax and make a hole for the mounting screw. I'll heat the end with a large soldering gun or propane torch and then tin the ends with a good quality solder. After it cools, each end can be connected with a sheet metal screw and washer. Common places that need to be bonded in this way are the trunk lid and hood to the main car body.

So how did your installation go? Drop me a line with your experiences. Next month, we'll be talking about some accessories and other gadgets that make operating easier and more fun. 'Til then, 73!

Morse Code — The Once and Future Mode

continued from page 14

The more you do it, the better you get, but you never quite reach perfection.

There are many, many techniques for learning Morse code and for increasing proficiency. The unsaid secret is that almost *any* of them will work if you give them a chance. The only way to really learn Morse code is to use it. You are teaching your brain to understand what it is hearing, and teaching your hand to send what you are thinking. Skills are developed through use, and there are no shortcuts.

As amateurs, we do often have unrealistic expectations about learning Morse code. There are few if any professional Morse operators left in the world, although there are lot of hams who used to be pros. A professional is someone who makes his living from sending and receiving code, eight hours a day or more, day in and day out. It's their *job*.

Amateurs have limited time available, and so it takes a good bit longer to reach anything resembling "mastery" of Morse code, but it will happen if you keep at it. At some point, whether you are giving a "first QSO" to a Novice at 5 wpm or rag-chewing with a friend at 20 wpm, it will suddenly dawn on you that you are not copying what is being sent, you are *hearing what is being said.*

That's the point at which you will have discovered the real joy of Morse code, and become a member of the international and eternal brotherhood of brasspounders. Not because you have to, and not because it is fun, but simply because you can.

Looking forward

From time to time, I hear speculation that we could face a natural disaster that wipes out most of what we call "technology," or perhaps a war with an enemy who has figured out how to use their technology to defeat ours. These scenarios are often dredged up in an attempt to justify preserving Morse code, which is seen as being under threat and in need of defense.

In the first place, if there were a sudden need for thousands of Morse operators, they could be trained very quickly — possibly more quickly than communication networks could be created for them to use. We went through that in World War II.

In the second place, Morse code will survive as long as people want to use it, and there is absolutely no question that it is the mode of choice for an increasing number of hams. There are many "sub-hobbies" within amateur radio, but the one area that has seen spectacular and sustained growth over the last few years is QRP (low power operation). Because of the power advantage (equivalent readability on the order of 18 dB greater than SSB), CW is used in the majority of QRP operations. QRP is inexpensive, it's environmentally friendly, it's challenging, and it's fun. CW is the mode that makes it possible, and you don't hear any complaints about Morse being "too hard." But don't take my word for it — listen around 7.040 almost any evening.

Diehard DXers know that CW will get through when SSB just won't cut it, and the same is true of the top contesters. Anybody who thinks CW is dying out should listen to the CW subbands during Field Day.

As the owner of a company that deals in Morse-related products, I'm in a position to know that interest in Morse code (and the machines that make it useful) has been growing steadily over the last four or five years. I'm also an active operator, so I know that use of CW on the air is also increasing. Maybe it's not "high tech." Or maybe, since it is direct digital input to the brain, it's as high as tech can get.

Either way, it's fun, it's rewarding, and it's going to be around a lot longer than I am.

Make Copies of This Article

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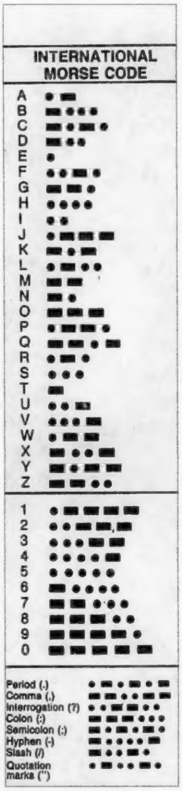
sent to you — just learn the sounds. For example, when you hear di-dah, just write the letter A. Practice, practice, and practice is the way to learn the code and to increase your speed. Give it a try. You may find that you really enjoy it and may even want to become a radio amateur. Have fun!

For information about amateur radio, contact the Amateur Radio Relay League, 225 Main St., Newington CT 06110, tel. (860) 594-0301, [www.arrl.org]; or The W5YI Group, Inc., P.O. Box 565101, Dallas TX 75356.

Companies that sell code practice kits include MFJ Enterprises, P.O. Box 494, Miss. State MS 39762, tel. (601) 323-6551, [www.mfjenterprises.com]; Electronic Rainbow, 6227 Coffman Rd., Indianapolis IN 46268, tel. (317) 291-7262; and Jade Products, P.O. Box 368, East Hampstead NH 03826-0368; tel. (800) 523-3776.



INTERNATIONAL MORSE CODE	
A	● ▬
B	▬ ● ● ●
C	▬ ● ▬ ●
D	▬ ● ●
E	●
F	● ● ▬ ●
G	▬ ▬ ●
H	● ● ● ●
I	● ●
J	● ▬ ▬ ▬
K	▬ ● ▬
L	● ▬ ● ●
M	▬ ▬
N	▬ ●
O	▬ ▬ ▬
P	● ▬ ▬ ●
Q	▬ ▬ ● ▬
R	● ▬ ●
S	● ● ●
T	▬
U	● ● ▬
V	● ● ● ▬
W	● ▬ ▬
X	▬ ● ● ▬
Y	▬ ● ▬ ▬
Z	▬ ▬ ● ●
1	● ▬ ▬ ▬ ▬
2	● ● ▬ ▬ ▬
3	● ● ● ▬ ▬
4	● ● ● ● ▬
5	● ● ● ● ●
6	▬ ● ● ● ●
7	▬ ▬ ● ● ●
8	▬ ▬ ▬ ● ●
9	▬ ▬ ▬ ▬ ●
0	▬ ▬ ▬ ▬ ▬
Period (.)	● ▬ ● ▬ ● ▬
Comma (,)	▬ ▬ ● ● ▬ ▬
Interrogation (?)	● ● ▬ ▬ ● ●
Colon (:)	▬ ▬ ▬ ● ● ●
Semicolon (;)	▬ ● ▬ ● ▬ ●
Hyphen (-)	▬ ● ● ● ● ▬
Slash (/)	▬ ● ● ▬ ●
Quotation marks (")	● ▬ ● ● ▬ ●

Fig. 2. The International Code — for radio communication. (Courtesy of *ARRL Operating Manual,* 4th ed., 2nd printing 1993; pp 17–25.)

OK, so what's the speed of dark?

More on Embedded TICKS

continued from page 22

ways to keep me out of the shack and not reinforce my addiction to ham radio.

The kit went together easily and without any problems. It powered up right away and let me know it was feeling OK by emitting a "dit-dit." The TICK-2 emits a "dit-dit-dit."

There are supplemental instructions telling how to run the TICK using less power consumption. Using less battery power is a kind of religious thing for many QRPers.

The TICK-1 keyer is easy to use. All functions are accessible through the single button interface. After the keyer starts up and dits at you, you can select its other functions by holding down the push-button and then using the paddles for some input. The keyer chip gives audio output to tell what function you have reached by sending the first letter of the function in Morse code. By holding down the button, you cycle through the functions. **Table 1** explains the TICK-1 functions.

Embedded Research also has released other keyers in either chip or kit format. I have summarized their features in **Table 2**. The pinouts on all the TICK chips are the same, so upgrading from one set of features to any other level is very easy. All you have to do is purchase the new chip, pop out the old, and replace it with the new.

The Finger

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moment, visualizing an old man in a wheel chair waiting and wondering and wishing. I needn't have. A wavering signal came on calling him and signing a W5 call.

"Behold the triumph of the finger, Hunky Hollowers," I said. "You ready for that beer?"

QRP

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and key. Hook up the dummy load to the antenna jack and apply power, watching that all-important polarity, and key down. You should see at least one watt of RF into the dummy load.

To adjust the receiver section, tweak the antenna trimmer cap, and that's all there is!

How does it work?

The first thing you have to understand is that the Vectronics is a very simple transceiver made up of time-tested circuits. It's unfair to compare this rig with a $1500 transceiver. Now, having said that, the Vectronics operates as you would expect.

The receiver is quite sensitive. You can easily hear stations that are quite weak. And, that's a problem. With only one tuned circuit in the front end, the receiver is easily overloaded. The front-end "brute force" RF gain control does help, but does not eliminate the problem.

With one watt, you can easily work plenty of stations on 40 meters. The VXO gave me about 7 kHz worth of operation. Keying is crisp and clean with no chirps or tweets.

I was glad to see Vectronics use a 2N3055 in the final instead of the 2N3836. The 3055 is much tamer and is robust enough to withstand a mismatch antenna for a few minutes.

Some loose ends for the Vectronics transceiver

I did not get the VEC1300KC enclosure. It would be in your best interest to get this case along with your transceiver. There are enough holes to drill to make the matching enclosure a good value.

The Vectronics transceiver does not support semibreak-in or QSK switching. You must manually change from receive mode to transmit mode by pushing in a switch. I found that most time-consuming.

There's no sidetone, either. Although Vectronics allows you to key an external piezo sounder. I used a separate receiver tuned to the output of the rig. With the RF gain down and no antenna, the receiver provided me with a sidetone.

The use of a resonant antenna would help eliminate the receiver problems. Also, a handful of parts could be added to the audio chain before the LM386 to help tighten up the bandwidth of the receiver.

The Vectronics would be a great base to which to add on lots of home-brew goodies. Anyone for a digital readout?

All and all, the bottom line is the Vectronics is a great place to start QRPing. It's an easy kit to build and will provide lots of QSOs. The rig is simple enough for anyone to build, and it would be a great tool for the class.

Vaya Con (Ra)Dios

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Outside the town of Sant Marti Sarroca, 30 miles from Barcelona, lives Pere EA3AJI (**Photo N**). A computer programmer, he started in amateur radio in 1991. His location is about 1100 feet above sea level, and his tower is 64 feet high. Pere's antennas are: a Hy-Gain TH-11DX with 11 elements for 10-12-15-17-20 meters, a rotatable rigid dipole for 40 meters, and an inverted V for 80 meters. He has an IC-775DSP and the Ulvin Tremendus III 5 kW amplifier (2.5 kW pep), as well as an IC-R7100 receiver and a TM-V7 for 2 meters and 70 cm. Pere works SSB, CW, and some RTTY. His E-mail is [ea3aji@ctv.es]. He is a DXer with 315 entities, has QSL cards, and also has worked EA0JC, second operator Jose. His father-in-law Antonio is EA3CLQ.

In Sant Pere de Ribes is Miquel EA3NB (**Photo O**), an electronics engineer licensed in 1979. He works for Roca, where he designs electronic devices for sophisticated bathroom fixtures such as shower cabinets with radio, telephone, control of water flow and temperature, etc.

On his 38-foot-high roof, Miquel has a 35-foot tower with a TA-33 3-element yagi for 10-15-20 meters, a rotatable Cushcraft D-40 rigid dipole for 40 meters, and an inverted V for 80 meters. He is a DXer with 312 entities, and works on SSB, CW, and RTTY. He uses his computer for logging with DX4WIN, has DX cluster, and is on the Internet. He has QSL cards and his E-mail is [ea3nb@redestb.es].

The entire trip lasted 22 days, and I met amateurs in Catalonia, the island of Mallorca, Madrid, Valencia, and Andorra. Each group will be described in a separate travelogue. I admit that I like the Spanish people, their personalities and ways of life.

I especially admire their mentality. They have very sound advice that unfortunately I could not follow, but my son Thomas KB2KRN is already an expert:

"Live off your parents, until you can live off your children!"

THE DIGITAL PORT

continued from page 48

waterfall as in PSK31) could not be used because it would bring the other functions of the program to a grinding halt. So he was still able to use MT63 effectively because the other stations could do the fine tuning. Darn near as user-friendly as it gets.

Both the Hellschreiber and the MT63 programs use a waterfall display for tuning, but they are not quite the same as their counterparts in PSK31. They are wider and they go sideways, from right to left. The MT63 displayed signal is very wide on the screen. I was trying to think of a comparison of water that goes sideways. I could only think of a fire hose and that isn't correct. You expect to see water from a hose in an arc. Of course, since this only a short distance on the display, maybe it is just a matter of relativity. You will have to download it and decide for yourself. It is fun, however you see it.

One last adventure. I have been working at getting the Icom 735 to speak a bit more fluently to the computer. That is, to record mode and settings for logging purposes just like the modern rigs are supposed to do. It turns out to be more involved than just plugging in an interface.

I have learned a lot thus far. When I started looking into this, I thought there would be a lot of individual signals ported through one of the accessory ports. Well, surprise me, all the available data comes out of a simple monaural plug (one wire with a shield) and, next surprise, available control is accomplished via the same single cable.

I have an interface working and am in the midst of exploring various software available. I have one other Icom-specific piece of software to get up and running, and then I have instructions on how to increase the agonizingly slow 1200 baud rate of the radio so that it will talk to the Logger program. Results to come. Most people would simply buy a newer, more computer-friendly radio, but this is fun. (Most of the way.)

If you have questions or comments about this column, E-mail me at [jheller@sierra.net]. I will gladly share what I know, or find a resource for you. For now, 73, Jack KB7NO.

THE DX FORUM

continued from page 54

the segment which appeared on his "DX Partyline" program, I chose the generic title of "Tech Talk" in the hope that one day someone else would be able to step in and keep the program going. He was the one who added the tag "with Dr. Rick."

Hopefully, we will hear "Tech Talk with (somebody else)" on his program very soon. It was great fun producing those segments, and I already lament having made the decision to step away. Thanks to all who listened, and especially to those who took the time to send along their comments and good wishes.

A tool for tropical band DXers

Last month, I received a very nice note from Willi Passman, who, for the past ten years, has been an editor for the *ADDX Kurier*, a German SWL magazine for the 4500 members of the ADDX organization. He invited me to check out his Web page that describes the services he provides to the SWL community. I was quite impressed with what he has done, and invite you to check it out for yourselves at [www.radioportal.org]. (See **Photo D**.)

Vox populi — the voice of the people!

Boy, that sounds funny coming from a dyed-in-the-wool Goldwater Republican like me (just kidding), but, nevertheless, that is the main idea of this column: a personal focus on the pursuit of DX. If all goes as planned, this feature will be added to the DX Forum, starting with the May issue. This will be a segment that will allow folks like yourselves to share your personal feelings and express your own opinions about what is going on in the world of DX.

I also plan to include some survey questions and results. To kick the three-month editorial flywheel into motion, I will salt the Internet this month with some questions. Once we get rolling, I expect that the fodder of current events will cause material to flow in to my E-mail and snail-mail boxes directly.

There are rules. There always have to be rules, right? Well, in this case, yes. For this to be a credible forum, I must require that your feelings and expressions be communicated in a civil manner. You will be much more successful in getting your point across if you take the time to think your comments through, and present a cogent argument. I will not publish commentary that is riddled with incendiary invective and misanthropic persiflage. Oh, I'll be glad to read it if you send it along, but the power of the editor's pen will hold sway, I gah-run-tee!

Pulling the big switch

So much for this month's offering. I look forward to hearing from all of you very soon, so 73 and good DX!!

QRX

continued from page 6

To register for the ULS, visit [http://www.fcc.gov/wtb/uls] and click on "TIN/Call Sign Registration." Paper registration also is possible. For more information, call tollfree (888) CALL-FCC (225-5322).

Thanks to the ARRL, via The Repeater *(Warrensburg [MO] Area ARC, Inc.), Katie Pautz WØKTE, compiler.*

US Navy Abandons Radioman Rating

First, the United States military decided it no longer needed to use the Morse code. Now, the Navy is doing away with the last vestige of its ties to traditional terrestrial two-way communications. This, as it announced last fall that it is abandoning the rank of Radioman.

The Navy said that the rating of Radioman would be changed to Information Systems Technician, effective immediately. The announcement said that the Navy made the change because doing so is consistent with ongoing efforts to properly man and train its personnel to handle the changing environment of the Information Age.

But the Navy has made one concession to the past. It says that in keeping with the tradition of the Radioman rating, the rating badge showing electronic sparks will be retained for the new Information Systems Technician.

Thanks to Hudson Loop *and* TWIAR, *via* Newsline, *Bill Pasternak WA6ITF, editor.*

Marconi Artifacts Discovered

Has one of Marconi's early antennas been found in his hometown? According to newspaper reports out of Milan, someone may have discovered pieces of an antenna wire hidden in the branches of a large tree in the park of the house where the young Guglielmo Marconi lived and carried out his experiments at the end of the 19th century. According to the story, the searchers also found a metal plate that may have been used by Marconi as a ground.

This story was first reported in ham radio circles by Giosalberto Lazzara IK2AIT, and then published in an ARRL Letter. Further news reports say that other artifacts of Marconi's youth have also now have been found.

Thanks to the ARRL, via Newsline, *Bill Pasternak WA6ITF, editor.*

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Jim Gray W1XU/7
210 Chateau Circle
Payson AZ 85541
[jimpeg@netzone.com]

A Good Month, No Foolin'!

Seasonal effects: April is expected to be a good month for HF propagation, with very few anticipated ionospheric upsets.

As you can see from the calendar, the first nine or ten days of the month should be unusually good with the near peak of Sunspot Cycle 23 combining with seasonably favorable conditions. We don't anticipate Poor or Very Poor conditions this month, but you can expect days of Fair or trending conditions as shown on the calendar.

For those who enjoy "keeping an eye on the sky," look for a close grouping of Jupiter, Mars, and Saturn in the west after sunset during the evenings of April 5–15, with the crescent Moon next to Saturn on the 6th. Just before sunrise on April 28th, Venus and Mercury will appear less than a half-degree apart, but could be masked by the glare of the rising Sun.

April 2000

SUN	MON	TUE	WED	THU	FRI	SAT
						1 G
2 G	3 G	4 G	5 G	6 G	7 G	8 G
9 G-F	10 F	11 F-G	12 G	13 G-F	14 F	15 F-G
16 G	17 G-F	18 F-P	19 P-F	20 F-G	21 G	22 G-F
23 F-P	24 P-F	25 G	26 G	27 G	28 G	29 G
30 G						

EASTERN UNITED STATES TO:

GMT:	00	02	04	06	08	10	12	14	16	18	20	22
ALASKA	10/12		20				17/20	20			15/17	10/12
ARGENTINA	15/17	15/17	20	30/40	30/40			10/12			12/15	12/15
AUSTRALIA	10/12	17/20	20	20	20	30/40	30/40	17/20				10/12
CENTRAL AM.	15/17	17/20	17/20	17/20	17/20	15/17	15/17	10/12	10/12	10/12	17/20	10/12
ENGLAND	17/20	30/40	40/80	40/80	30/40			15/17	10/12	15/17	15/17	17/20
HAWAII	10/12	12/15	17/20	17/20	20/30	20/30	17/20	17/20				10/12
INDIA	17/20	17/20						15/17				
JAPAN	10/12		17/20				17/20	17/20			15/17	10/12
MEXICO	12/15	20/40	20/40	20/40	20/40	15/17	15/17	10/12	10/12	10/12	17/20	10/12
PHILIPPINES	15/17		17/20	17/20			17/20	15/17	10/12			15/17
PUERTO RICO	15/17	17/20	17/20	17/20	17/20	15/17	15/17	10/12	10/12	10/12	17/20	10/12
RUSSIA (C.I.S.)	30/40	30/40	17/20	17/20				10/12	10/12	12/15	17/20	17/20
SOUTH AFRICA	20/30	40	20/30	20/30					10/12	10/12	12/15	12/15
WEST COAST	20/30	20/30	20/30	30/40	30/40			10/12	10/12	10/12	15/17	17/20
CENTRAL UNITED STATES TO:												
ALASKA	10/12	12/15	17/20	17/20	20		17/20	17/20				10/12
ARGENTINA	15/17	15/17	20/30	20/30	17/20			10/12			10/12	12/15
AUSTRALIA	10/12	15/17	15/17		17/20	20/30	30/40	17/20			12/15	10/12
CENTRAL AM.	15/17	15/17	17/20	17/20	20/30			10/12	15/17	10/12	10/12	10/12
ENGLAND	30/40	30/40	30/40						12/15	12/15	17/20	17/20
HAWAII	12/15	15/17	15/17	17/20	17/20	20/30	30/40	17/20		10/12	12/15	12/15
INDIA	15/17	17/20						12/15	12/15			
JAPAN	10/12	12/15	17/20	17/20	17/20		17/20	17/20				10/12
MEXICO	10/12	15/17	17/20	17/20	17/20			10/12	10/12	10/12	12/15	12/15
PHILIPPINES	10/12		15/20	17/20					10/12	10/12		
PUERTO RICO	15/17	15/17	20/30	20/30	20/30			10/12	10/12	10/12	10/12	10/12
RUSSIA (C.I.S.)								12/15	12/15	12/15	17/20	17/20
SOUTH AFRICA			17/20	17/20					12/15	12/15	15/17	17/20
WESTERN UNITED STATES TO:												
ALASKA	10/12	10/12	15/17	17/20	17/20	17/20		17/20	17/20			15/17
ARGENTINA	10/12	12/15	15/17	17/20	17/20						10/12	10/12
AUSTRALIA	10/12	12/15	15/17	15/17	17/20	17/20	17/20		17/20			
CENTRAL AM.	10/12	12/15	15/17	17/20	30/40				10/12	10/12	10/12	12/15
ENGLAND	17/20	17/20							15/17	15/17	17/20	17/20
HAWAII	10/12	10/12	12/15	15/17	20/30	20/30	30/40		12/15	10/12		
INDIA		15/17	17/20						12/15	15/17		
JAPAN	10/12	10/12	12/15	17/20	17/20	17/20			17/20			15/17
MEXICO	10/12	12/15	15/30	17/30	20/30				10/12	10/12	10/12	12/15
PHILIPPINES	10/12	10/12						17/20	15/17	17/20		
PUERTO RICO	10/12	12/15	15/30	15/30	17/30				10/12	10/12	10/12	12/15
RUSSIA (C.I.S.)	17/20				17/20			17/20	17/20	20	20	20
SOUTH AFRICA	17/20	20		20						10/12	12/15	12/15
EAST COAST	20/30	20/30	30/40	30/40	30/40			10/12	12/15	12/15	15/17	17/20

General band-by-band forecast:

10 and 12 meters

Fairly regular DX may be expected on Good (G) days to Europe and the East before noon, and to Africa shortly after noon. Also, you may find good band openings to South America, the Pacific, and the southern hemisphere during the afternoon. Short skip between 1,000 and 2,000 miles during the day is anticipated for most days.

15 and 17 meters

You can look for excellent daytime DX to the southern hemisphere and to most areas of the world, peaking to Europe before noon and to most other areas of the world during the afternoon; daytime short skip beyond 1,000 miles will be frequent.

20 meters

Excellent DX openings to most areas of the world are expected on Good (G) days from local sunrise until long after sunset. Peak conditions should occur an hour or two after sunrise and again in the late afternoon. On Good (G) days, DX into the southern hemisphere can be worked during the hours of darkness as well. Short skip from 500 to over 2,000 miles is anticipated on most days.

30 and 40 meters

These may be your best DX bands from local sunset until sunrise, when you can expect frequent openings and often strong signals into the southern hemisphere. Daytime short skip to about 1,000 miles is expected, and beyond 750 miles after dark.

80 and 160 meters

Worldwide DX can be expected from local sunset through the darkness hours on Good (G) nights, limited of course by thunderstorm static on some paths. Short skip at night will extend between 1,000 and 2,000 miles. 73

NEVER SAY DIE

continued from page 27

and burning. Yes, I've been very critical of the League for not bothering to try to promote the hobby. Well, by now it's clear that no matter how severe the emergency, they're not planning to do anything. Nor is the ailing ham industry.

And that puts the ball in your court. Well, your local ham club, anyway. We need promotion. We need to get the word out to the public that there still is such a hobby and that it's a lot of fun. Plus, if one takes advantage of the opportunity, it can be very educational and lead to some great careers.

I've been doing my bit by getting on the radio with Art Bell W6OBB and talking up the hobby for hours. My guest appearance in January led to several hundred new subscribers, plus piles of mail asking for more information. Well, as I keep explaining, amateur radio has provided me with a lifetime of excitement and adventure. Of course, this only happens if you are the kind of person who quickly answers the door when opportunity knocks. 90% of the public just puts in their ear plugs.

What can you do? That's easy! There are thousands of radio talk shows. Thousands. So get busy and get yourself interviewed by a radio talk show host. I've been on dozens of talk shows, talking up the hobby. I've been pushing it when I lecture to college groups about entrepreneurialism. I push it when I'm addressing scientific audiences.

Imagine what would happen if a thousand hams got busy talking up our hobby on talk radio! Hey, you're hams and used to talking on the radio, so what's the big deal? Of course, if you are mike shy, then at least help to get me set up for an interview. I'm used to it and I know what the hot buttons are to get the public interested.

Well, that's simple. I just point out what the benefits are to them of becoming a ham. For instance, once you have a ham rig, you are never again going to be lonely — unless you want to be, and turn off the big switch.

When I'm visiting some new city, I have my HT along and presto, I'm in a contact with two or three locals. I get invites to come over to visit. I get good advice on restaurants and local activities. What a difference from being cooped up in a hotel or motel room with nothing but the TV for company. Phooey.

And when I visit other countries, I have fraternity brothers eager to welcome me and show me around.

Now get busy. Get your club members to find out about any local radio talk shows and see how many hams you can get interviewed as guests. Set me up for a guest shot.

If the general public doesn't know ham radio exists, we aren't going to grow. We need exposure to build that awareness. Explain how simple it is to get our entry license. Heck, we have four-year-old hams! And seven-year-old girls with Extras.

Invite the listeners to your club meetings. Explain about how much fun using our repeaters can be. Tell 'em about our two dozen ham satellites. Moonbounce, DXing, contests, foxhunting, and so on. Packet, slow scan, RTTY, and other aspects of the hobby. Get 'em excited. And explain that it doesn't take a genius, and that the Morse code barrier has gone the way of the Berlin Wall.

Life Fields

A couple of years ago, I tried to get you to build a millivoltmeter and write a construction article so that the readers could get busy and start measuring the millivolt life fields which are around every living thing. If you can find a copy of *Blueprint for Immortality* by Professor Harold Burr (Yale), you'll get more details on his pioneering work. But even without that reference, you should be able to replicate a lot of his work.

Using a millivoltmeter, you'll be able to check on the health of people or animals. It can tell you when a woman is going to ovulate, which is particularly valuable information for couples anxious to have a child. It'll also give early warning when a cancer is being formed. It can be used to detect mental problems.

You're an electronic expert, so get busy with this and let me know what you learn so that I can pass it along and get others to join in the research.

No, I don't know where the measurements are made, so let us know about that, too.

Fetal Bombs

Maybe you noticed the *Newsweek* cover story about the effects prenatal influences can have on people later in life. If you are the kind of person who stops and thinks about things (which seems to be a rarity these days), it makes sense that anything that happens to you during your first weeks and months of life can easily influence your whole life.

A baby starts learning much earlier than most people realize. The book *The Prenatal Classroom* explains how a baby can learn around a hundred words before it's born. And there are several things parents can do which will substantially increase a baby's IQ. I've written about some of these, and plan to at least do a booklet on how parents can raise their baby's IQ by around 40 to 50 points, putting many babies into the genius class, and perhaps helping the child become a prodigy.

One problem with helping babies to learn is that many parents are unaware that babies go through phases when their brains will grow incredibly, if given the proper stimulation. The sad part is that lacking that stimulation, the brain will never again be able to replace that lost growth. Depriving children of the needed stimulation is akin to chopping off one hand or a foot as far as permanently hobbling the child is concerned.

For instance? Have you read about the IQ difference between babies which are breastfed and those which are bottlefed? It runs 5 to 8 points! And that can be the difference between being able to cope with college and not.

It's nice to start seeing some of this information appearing in magazines like *Newsweek.* If you're interested in reading more, check the books on the subject that I've reviewed in my *Secret Guide to Wisdom.*

Micro Web Server

A graduate student at the University of Massachusetts has built what is believed to be the world's smallest Web server. It's about the size of a match-head and costs less than 4¢ to make!

In the first six weeks after going on-line, the server has served about 45,000 Web pages to about 6,000 users from 56 countries. Check out www.ccs.cs.umass.edu/-shri/iPic.html, where you'll find a picture of the computer compared with a quarter.

So what? If the chips operating your household appliances are replaced with these servers, you'll be able to program your VCR from anywhere, even your car, turn on your microwave oven to cook that roast, set the thermostat to warm up your home, and so on. Hmm, does your garden or lawn need watering?

Okay, get your brain into gear and let's see how many ham applications you can come up with. How difficult will it be to get on the air via the Internet from your home station from anywhere in the world and work that DXpedition? Or will our DX clubs start installing remotely operated stations in the rarest countries for anyone to put on the air from anywhere? What a way to operate from Spratley Island for the next contest!

Bum Dope

A letter from a reader who asked the HamVention forum chairman how come I wasn't on the program was told that this was my choice, not theirs, plus that I'd demanded a $1,000 speaking fee, plus all expenses (first class air, hotel, food).

Holy mackerel! I don't demand a $1,000 speaking fee. And the only time I travel first class is when I'm flying on free airline miles from my Continental Airlines Visa card. I don't think I've ever required the HamVention to pay any of my expenses for anything, although I do ask most hamfests to pay for my air fare and hotel.

I love giving talks at hamfests and conventions, and I always draw the biggest audiences. Well, I'm controversial and I make sure my talks are both fun and educational. I try to get as many hams as I can interested in taking advantage of the fun and excitement ham radio can provide.

I've been speaking at quite a few universities about entrepreneurialism, giving keynote talks at educational, music, and science conferences, and having a lot of fun lately being a guest on talk radio shows. I talk about how easy it is to make money, to enjoy excellent health, how to improve our school system and, in particular, about amateur radio. I was the keynote speaker at the New Hampshire Reform Party's 1999 Convention. I got a free lunch out of it. You can get a copy of my speech for a buck (item #85). See my ad or check out www.waynegreen.com.

I suppose it would be too embarrassing for the forum chairman to admit that the League had pressured him to keep me from speaking, thus that crock about me demanding $1,000, and so on.

With it getting ever easier to do videos, I've invested in a new digital video camera and

Continued on page 64

Wise Up!

Here are some of my books which can change your life (if you'll let 'em). If the idea of being healthy, wealthy and wise interests you, start reading. Yes, you can be all that, but only when you know the secrets which I've spent a lifetime uncovering.

......Wayne

The Bioelectrifier Handbook: This explains how to build or buy ($155) a little electrical gadget that can help clean the blood of any virus, microbe, parasite, fungus or yeast. The process was discovered by scientists at the Albert Einstein College of Medicine, quickly patented, and hushed up. It's curing AIDS, hepatitis C, and a bunch of other serious illnesses. The circuit can be built for under $20 from the instructions in the book. $10 (01)

The Secret Guide to Wisdom: This is a review of around a hundred books that will help you change your life. No, I don't sell these books. They're on a wide range of subjects and will help to make you a very interesting person. Wait'll you see some of the gems you've missed reading. $5 (02)

The Secret Guide to Wealth: Just as with health, you'll find that you have been brainwashed by "the system" into a pattern of life that will keep you from ever making much money and having the freedom to travel and do what you want. I explain how anyone can get a dream job with no college, no résumé, and even without any experience. I explain how you can get someone to happily pay you to learn what you need to know to start your own business. $5 (03)

The Secret Guide to Health: Yes, there really is a secret to regaining your health and adding 30 to 60 years of healthy living to your life. The answer is simple, but it means making some difficult lifestyle changes. Will you be skiing the slopes of Aspen with me when you're 90 or doddering around a nursing home? Or pushing up daisies? No, I'm not selling any health products. $5 (04)

My WWII Submarine Adventures: Yes, I spent from 1943-1945 on a submarine, right in the middle of the war with Japan. We almost got sunk several times, and twice I was in the right place at the right time to save the boat. What's it really like to be depth charged? And what's the daily life aboard a submarine like? How about the Amelia Earhart inside story?If you're near Mobile, please visit the Drum. $5 (10)

Wayne's Caribbean Adventures: My super budget travel stories – where I visit the hams and scuba dive most of the islands of the Caribbean. You'll love the special Liat fare which let me visit 11 countries in 21 days, diving all but one of the islands, Guadeloupe, where the hams kept me too busy with parties. $5 (12)

Cold Fusion Overview: This is both a brief history of cold fusion, which I predict will be one of the largest industries in the world in the 21st century, plus a simple explanation of how and why it works. This new field is going to generate a whole new bunch of billionaires, just as the personal computer industry did. $5 (20)

Cold Fusion Journal: They laughed when I predicted the PC industry growth in 1975. PCs are now the third largest industry in the world. The cold fusion ground floor is still wide open, but then that might mean giving up watching ball games. Sample: $10 (22).

Julian Schwinger: A Nobel laureate's talk about cold fusion—confirming its validity. $2 (24)

Improving State Government: Here are 24 ways that state governments can cut expenses enormously, while providing far better service. I explain how any government bureau or department can be gotten to cut it's expenses by at least 50% in three years and do it cooperatively and enthusiastically. I explain how, by applying a new technology, the state can make it possible to provide all needed services without having to levy *any* taxes at all! Read the book, run for your legislature, and let's get busy making this country work like its founders wanted it to. Don't leave this for "someone else" to do. $5 (30)

Mankind's Extinction Predictions: If any one of the experts who has written books predicting a soon-to-come catastrophe which will virtually wipe us all out is right, we're in trouble. In this book I explain about the various disaster scenarios, from Nostradamus, who says the poles will soon shift, wiping out 97% of mankind, to Sai Baba, who has recently warned his followers to get out of Japan and Australia before December 6th this year. The worst part of these predictions is the accuracy record of some of the experts. Will it be a pole shift, a new ice age, a massive solar flare, a comet or asteroid, a bioterrorist attack, or even Y2K? I'm getting ready, how about you? $5 (31)

Moondoggle: After reading René's book, *NASA Mooned America*, I read everything I could find on our Moon landings. I watched the videos, looked carefully at the photos, read the astronaut's biographies, and talked with some of my readers who worked for NASA. This book cites 25 good reasons I believe the whole Apollo program had to have been faked. $5 (32)

Classical Music Guide: A list of 100 CDs which will provide you with an outstanding collection of the finest classical music ever written. This is what you need to help you reduce stress. Classical music also raises youngster's IQs, helps plants grow faster, and will make you healthier. Just wait'll you hear some of Gotschalk's fabulous music! $5 (33)

The Radar Coverup: Is police radar dangerous? Ross Adey K6UI, a world authority, confirms the dangers of radio and magnetic fields. $3 (34)

Three Gatto Talks: A prize-winning teacher explains what's wrong with American schools and why our kids are not being educated. Why are Swedish youngsters, who start school at 7 years of age, leaving our kids in the dust? Our kids are intentionally being dumbed down by our school system — the least effective and most expensive in the world. $5 (35)

Aspartame: a.k.a. NutraSweet, the stuff in diet drinks, etc., can cause all kinds of serious health problems. Multiple sclerosis, for one. Read all about it, two pamphlets for a buck. (38)

One Hour CW: Using this sneaky booklet even *you* can learn the Morse Code in one hour and pass that dumb 5wpm Tech-Plus ham test. $5 (40)

Code Tape (T5): This tape will teach you the letters, numbers and punctuation you need to know if you are going on to learn the code at 13 or 20 wpm. $5 (41)

Code Tape (T13): Once you know the code for the letters (41) you can go immediately to copying 13 wpm code (using my system). This should only take two or three days. $5 (42)

Code Tape (T20): Start right out at 20 wpm and master it in a weekend. $5 (43)

Wayne Talks Not at Dayton: This is a 90-minute tape of the talk I'd have given at the Dayton, if invited. $5 (50)

Wayne Talks at Tampa: This is the talk I gave at the Tampa Global Sciences conference. I cover cold fusion, amateur radio, health, books you should read, and so on. $5 (51)

$1 Million Sales Video: The secret of how you can generate an extra million in sales using PR. This will be one of the best investments you or your business will ever make. $43 (52)

Reprints of My Editorials from *73*.

Grist I: 50 of my best non-ham oriented editorials from before 1997. $5 (71)

Grist II: 50 more choice non-ham editorials from before 1997.$5 (72)

1997 Editorials: 148 pages. 216 editorials discussing health, ideas for new businesses, exciting new books I've discovered, ways to cure our country's more serious problems, flight 800, the Oklahoma City bombing, more Moon madness, and so on. $10 (74)

1998 Editorials: 168 pages that'll give you lots of controversial things to talk about on the air. $10 (75)

1999 Editorials: 132 pages of ideas, book reviews, health, education, and anything else I think you ought to know about. $10 (76)

2000 Editorials: In the works.

Silver Wire: With two 3" pieces of heavy pure silver wire + three 9V batteries you can make a thousand dollars worth of silver colloid. What do you do with it? It does what the antibiotics do, but germs can't adapt to it. Use it to get rid of germs on food, for skin fungus, warts, and even to drink, Read some books on the uses of silver colloid, it's like magic. $15 (80)

Wayne's Bell Saver Kit. The cable and instructions enabling you to inexpensively tape Art Bell W6OBB's nightly 5-hr radio talk show. $5 (83)

NH Reform Party Keynote Speech. It wow'd 'em when I laid out plans for NH in 2020, with outstanding and lower cost schools, no state taxes at all, far better health care, a more responsive state government, etc. $1 (85)

Stuff I didn't write, but you need:

NASA Mooned America: René makes an air-tight case that NASA faked the Moon landings. This book will convince even you. $25 (90)

Last Skeptic of Science: This is René's book where he debunks a bunch of accepted scientific beliefs – such as the ice ages, the Earth being a magnet, the Moon causing the tides, and etc. $25 (91)

Dark Moon: 568 pages of carefully researched proof that the Apollo Moon landings were a hoax. This is a capping blow for René's skeptics. $35 (92)

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Barter 'n' Buy

Number 64 on your Feedback card

Turn your old ham and computer gear into cash now. Sure, you can wait for a hamfest to try and dump it, but you know you'll get a far more realistic price if you have it out where 100,000 active ham potential buyers can see it, rather than the few hundred local hams who come by a flea market table. Check your attic, garage, cellar and closet shelves and get cash for your ham and computer gear before it's too old to sell. You know you're not going to use it again, so why leave it for your widow to throw out? That stuff isn't getting any younger!

The *73* Flea Market, Barter 'n' Buy, costs you peanuts (almost)— comes to 35 cents a word for individual (noncommercial!) ads and $1.00 a word for commercial ads. Don't plan on telling a long story. Use abbreviations, cram it in. But be honest. There are plenty of hams who love to fix things, so if it doesn't work, say so.

Make your list, count the words, including your call, address and phone number. Include a check or your credit card number and expiration. If you're placing a commercial ad, include an additional phone number, separate from your ad.

This is a monthly magazine, not a daily newspaper, so figure a couple months before the action starts; then be prepared. If you get too many calls, you priced it low. If you don't get many calls, too high.

So get busy. Blow the dust off, check everything out, make sure it still works right and maybe you can help make a ham newcomer or retired old timer happy with that rig you're not using now. Or you might get busy on your computer and put together a list of small gear/parts to send to those interested?

Send your ads and payment to: *73 Magazine*, Barter 'n' Buy, 70 Hancock Rd., Peterborough NH 03458 and get set for the phone calls. The deadline for the July 2000 classified ad section is May 10, 2000.

President Clinton probably doesn't have a copy of *Tormet's Electronics Bench Reference* but you should. Check it out at **[www.ohio.net/~rtormet/index.htm]**—over 100 pages of circuits, tables, RF design information, sources, etc. BNB530

TELEGRAPH COLLECTOR'S PRICE GUIDE: 250 pictures/prices. $12 postpaid. **ARTIFAX BOOKS**, Box 88, Maynard MA 01754. Telegraph Museum: [http://wltp.com]. BNB113

Great New Reference Manual with over 100 pgs of P/S, transistor, radio, op-amp, antenna designs, coil winding tables, etc. See details at [www.ohio. net/~rtormet/index.htm] or send check or M.O. for $19.95 + $2.00 P&H to RMT Engineering, 6863 Buffham Rd., Seville OH 44273. BNB202

RF TRANSISTORS TUBES 2SC2879, 2SC1971, 2SC1972, MRF247, MRF455, MB8719, 2SC1307, 2SC2029, MRF454, 2SC3133, 4CX250B, 12DQ6, 6KG6A, etc. **WESTGATE**, 1-800- 213-4563. BNB6000

QSL CARDS. Basic Styles; Black and White and Color Picture Cards; Custom Printed. Send 2 stamps for samples and literature. RAUM'S, 8617 Orchard Rd., Coopersburg PA 18036. Phone or FAX (215) 679-7238. BNB519

Cash for Collins: Buy any Collins Equipment. **Leo KJ6HI.** Tel./FAX (310) 670-6969. [radioleo@earthlink.net]. BNB425

WANTED: High capacity 12 volt solar panels for repeater. [**kk4ww@ fairs.org**] or (540) 763-2321. BNB2630

MAHLON LOOMIS, INVENTOR OF RADIO, by Thomas Appleby (copyright 1967). Second printing available from **JOHAN K.V. SVANHOLM N3RF**, SVANHOLM RESEARCH LABORATORIES, P.O. Box 81, Washington DC 20044. Please send $25.00 donation with $5.00 for S&H. BNB420

Ham Radio Repair, Quality workmanship. All Brands, Fast Service. **Affordable Electronics**, 7110 E. Thomas Rd., Scottsdale, AZ 85251. **Call 480-970-0963**, or E-mail **HAM SERVICE@AOL.COM**. BNB427

METHOD TO LEARN MORSE CODE FAST AND WITHOUT HANGUPS Johan N3RF. Send $1.00 & SASE. SVANHOLM RESEARCH LABORATORIES, P.O. Box 81, Washington DC 20044 USA. BNB421

ASTRON power supply, brand-new w/warranty, RS20M $99, RS35M $145, RS50M $209, RS70M $249. **Web:** [www.aventrade.com]. Call for other models. **(626) 286-0118**. BNB411

HEATHKIT COMPANY is selling photocopies of most Heathkit manuals. Only authorized source for copyright manuals. **Phone:** (616) 925- 5899, 8–4 ET. BNB964

"**MORSE CODE DECIPHERED**" Simple, elegant, inexpensive, comprehensive, logical, easy! E-mail [judlind@earthlink.net]. BNB428

Electricity, Magnetism, Gravity, The Big Bang. New explanation of basic forces of nature in this 91-page book covering early scientific theories and exploring latest controversial conclusions on their relationship to a unified field theory. To order, send check or money order for $16.95 to: American Science Innovations, PO Box 155, Clarington OH 43915. Web site for other products [http://www.asi_2000. com]. BNB100

COLLOIDAL SILVER GENERATOR! Why buy a "box of batteries" for hundreds of dollars? Current regulated, AC powered, fully assembled with #12 AWG silver electrodes, $74.50. Same, but DC powered, $54.50. Add $2.50 shipping. **Thomas Miller**, 962 Myers Parkway, Ashland OH 44805. BNB342

COLD FUSION! - FUEL CELL! - ELECTRIC BICYCLE! Each educational kit: (Basic - $99.95, Deluxe - $199.95, Information - $9.95.) CATALOG - $5.00. ELECTRIC AUTOMOBILE BOOK - $19.95. **KAYLOR-KIT**, POB 1550ST, Boulder Creek CA 95006-1550. (831) 338-2300. BNB128

Wanted Drake L4B or Heathkit SB-221 or SB-220, Hallicrafters HT-37 and SX101A. 1-888-917-9077(home), toll free, wnbryant@aol.com N5GXL Noel Bryant. BNB500

ROHN TOWERS HUGE DISCOUNTS CHECK PRICES AT HILLRADIO.NET BNB600

Wanted COLLINS S-LINE Pristine (RE) 32S3-A, 75S3-C, 516F2, 312B4, 30L1, or 30S1 and SM-3. Willing to pay top dollar for the station I have wanted since age 13. 1-512-925-3907 (cell), 1-888-917-9077(home), toll free residential, willbryant@aol.com WA5JUL Bill Bryant. **THIS STATION IS FOR PERSONAL USE, NOT FOR RESALE!** BNB700

TELEGRAPH KEYS AT DAYTON HAMFEST: 500+ Civil War - Present. Bring Yours! History, Information, Appraisals, pretzels! Buying, Trading, Selling. **SPACE 2555.** http://w1tp.com. BNB705

NEVER SAY DIE

continued from page 62

iMacDV for editing. I'll try doing some talks that way. I've done that in the past for some computer conventions and it's gone over well. In that way I won't have to be away to give my talks, and hamfests won't have to pay my travel expenses.

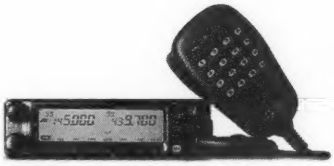
Cool, Man!

Art Bell W6OBB has been going on at length about global warming. So it was interesting when Hilly Rose, one of his guest hosts, interviewed a weather expert. According to Accuweather, the company corporations turn to when they want more accurate forecasts than the weather bureau can provide, satellite data has shown that the Earth has been cooling for the last 18 years. It's down 0.45°C in the last hundred years.

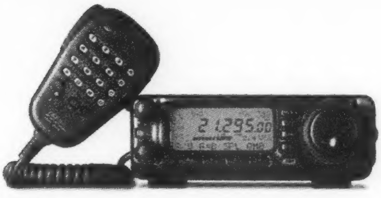
The Hartland Institute research has shown no warming trend, nor has the research done by Pace University.

Hilly has since been terminated as a guest host, so perhaps Art got upset. Art has been playing reruns of his old shows and having other guest hosts instead.

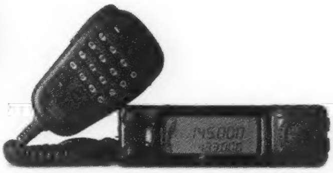
Yes, yes, I know about the melting ice in Antarctica.



FT-8100R
The versatile FT-8100R Dual Band Mobile offers rugged RF design, 50 Watt (VHF)/35 Watt (UHF) power output, 310 memory channels, Dual Receive (VV/UU/VU), Enhanced Smart Search,™ CTCSS Encode, and a TX Time-Out Timer. (ADMS-2E programming software available.)



FT-100
This ultra-compact HF/VHF/UHF 100W Transceiver provides SSB, CW, AM, FM and AFSK coverage of the HF, 6M, 2M and 70 CM bands. Features include 300 memory channels, built-in Electronic Memory Keyer, DSP, IF Shift, IF Noise Blanker, and CTCSS/DCS.

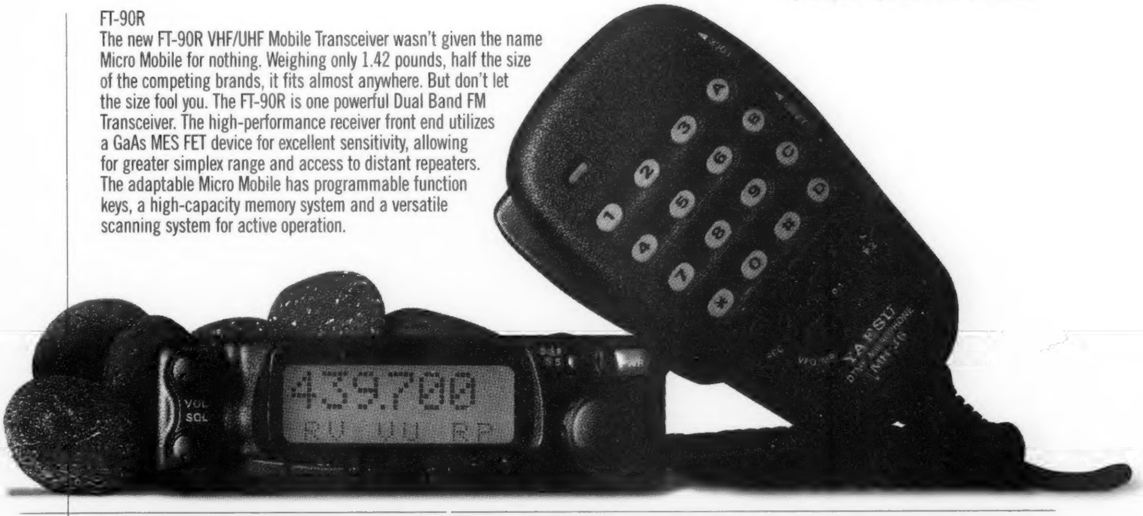


FT-3000M
This 70W high-powered 2M FM Mobile provides extended UHF receiver coverage, AM Aircraft RX, and is MIL-STD approved. The FT-3000M features 81 memory channels, Smart Search,™ CTCSS/DCS, optional ADMS-2E programming software, and is 1200/9600 Baud Packet compatible.

FT-290RII
Ideal for base, vacation, or expedition use, this 25 Watt 144 MHz Multimode Transceiver is outstanding for emergency, travel, or weak-signal DX work. Optional battery pack allows over-the-shoulder portable use for search-and-rescue operation.

FT-2600M
This heavy-duty VHF FM Mobile is encased in a durable aluminum die-cast chassis/heatsink assembly, and manufactured to MIL-STD 810 requirements. Features include 60 Watt power output, 179 memory channels, direct keypad frequency entry from microphone, Alphanumeric memories, and PC programming capability with optional ADMS-2E software.

FT-90R
The new FT-90R VHF/UHF Mobile Transceiver wasn't given the name Micro Mobile for nothing. Weighing only 1.42 pounds, half the size of the competing brands, it fits almost anywhere. But don't let the size fool you. The FT-90R is one powerful Dual Band FM Transceiver. The high-performance receiver front end utilizes a GaAs MES FET device for excellent sensitivity, allowing for greater simplex range and access to distant repeaters. The adaptable Micro Mobile has programmable function keys, a high-capacity memory system and a versatile scanning system for active operation.

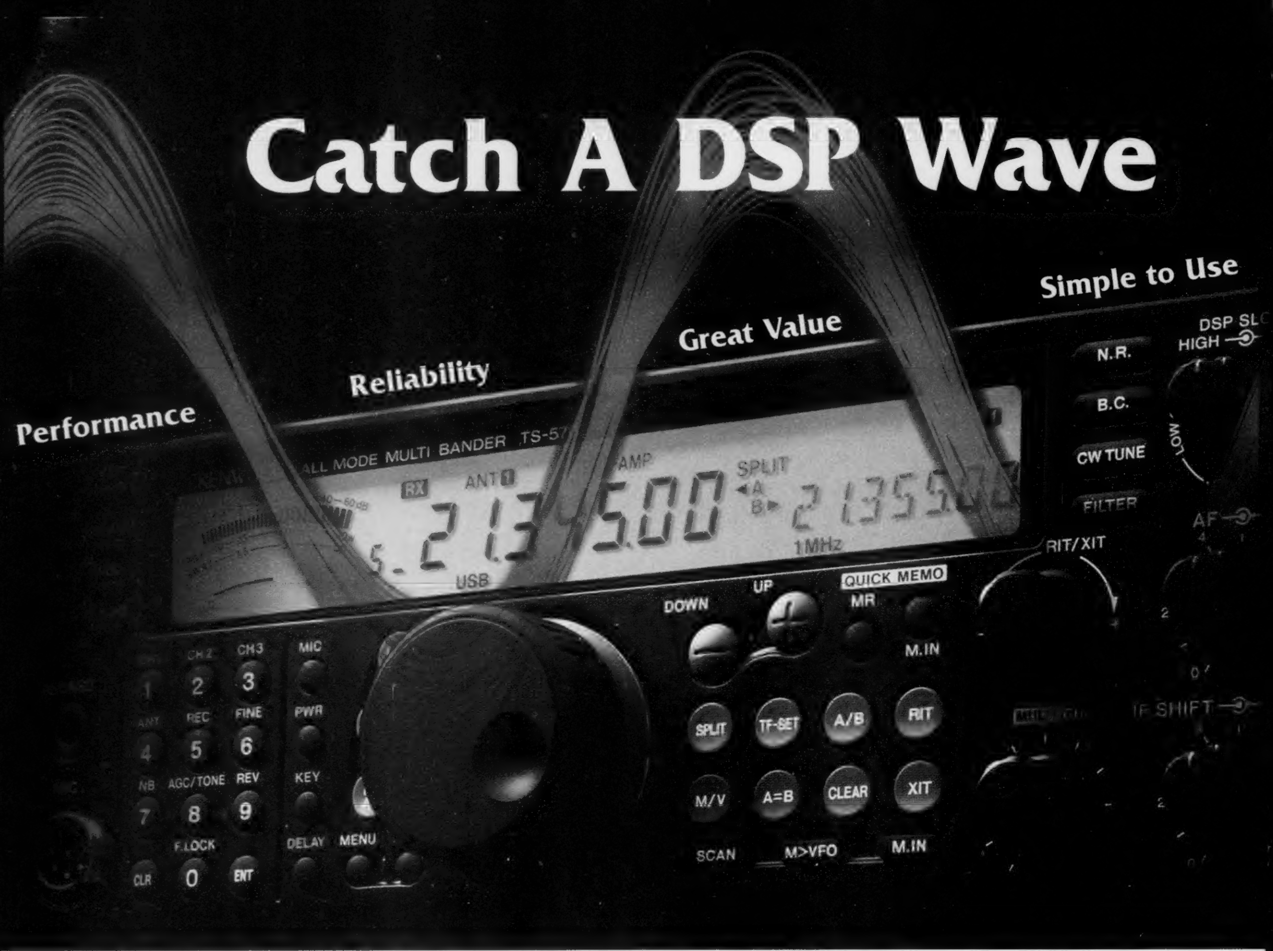


LITTLE BIG MOUTH.

Life is an adventure. So whether you're on expedition or vacation, you will probably encounter some rough going along the way. And when you do, you'll be glad that your mobile transceiver is a Yaesu. With units small enough to install almost anywhere and rugged enough to achieve military approval for shock and vibration, Yaesu is the obvious choice for dependability. Its exceptionally clear signal and wide dynamic range tame even the most crowded bands, and provide outstanding protection from intermodulation in urban areas. Learn more about Yaesu products on the web at www.yaesu.com

YAESU ...leading the way.

©1999 Yaesu USA, 17210 Edwards Road, Cerritos, CA 90703, (562) 404-2700. Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and/or options are standard in certain areas. Check with you local Yaesu dealer for specific details.



TS-570D(G) HF TRANSCEIVER/TS-570S(G) HF + 6M TRANSCEIVER

Kenwood has not been standing still since the introduction of the TS-570D/S HF Transceiver last year. Now you can command even more of Kenwood's advanced DSP technology with the G model.

The **DSP** filters and extracts signals with digital technology that is unmatchable with standard analog circuits. It provides **CD-class transmit and receive audio quality** that can be shaped to your needs, and two powerful noise reduction systems: **Line Enhancer Method** for SSB/AM modes, and **Speech Processing by Auto Correlation** (SPAC) for CW mode. DSP also enables the **CW-Auto Tune** feature that automatically zero-beats CW signals.

The **Extensive Memory Functions** provide a bank of 100 memory positions split into 90 standard channels for general operation and 10 for programmable VFO, programmable scan and long-term memory. Memory contents can be scrolled, copied or locked out. In addition there are **5 quick memories** for storing frequencies and modes on the fly, perfect for the busy DX contester.

The powerful **Menu System** incorporates **46 menu features** and an **on-line guide** for instant reference. The **large amber backlit LCD display** provides 4 light levels for clear readability under any lighting conditions.

The TS-570D/S has no shortcomings in the construction and performance area. The **continuous-duty 100 watt transmitter** incorporates a large heavy-duty heat sink with integrated cooling fan for non-stop operation even under extreme environmental conditions. The **wide-band receiver** is rock-stable from 500 kHz through 30 MHz with **dual pre-amps** and **dual bandpass filters** for exceptional selectivity and sensitivity.

With the features and performance of a high-end radio integrated into an affordable mobile-size package, the TS-570D/S is the perfect choice for the field or to build a full station around at home.

- ***FREE*** **operating manual via FTP site**
  ftp://ftp.kenwood.net
- Beat cancel
- 2 position antenna switch
- CW auto tune adjust (a world's first)
- Channel scan, program band scan, memory scan with channel lock-out and group channel scan, all with TO (time operated) or CO (carrier operated) resume modes
- Compact 10-5/8 inch by 3-3/4 inch front panel size for any travel or installation requirement
- Preset auto antenna tuner with 18 sub-bands
- Variable electronic keyer (0 and 100 wpm)
- Packet and FSK features
- RCP-2 software for PC-based display and memory configurations available via the Internet
- Full functionality on 6M (TS-570S) including DSP, 100 watts output and preset Auto Antenna Tuner

TS-570D/S (G) new features

■ TX sound quality monitor with 9-step monitor volume for absolute control over voice quality ■ NR1 (SSB) is operator controllable in 9-step increments, or automatically tracks input signal strength ■ New CW DSP Filters (80 Hz, 150 Hz and 500 Hz) give you a total of 11 user-selectable filters ■ NR1 and NR2 settings can now re-configure automatically when changing mode groups (SSB/AM/FM to CW/FSK) ■ Manual weight feature (with built-in electronic keyer) for adjusting the relative length of dots and dashes in 16 steps between 1:2.5 and 1:4.0 ■ Equalize receive signals, and use different settings for both TX and RX ■ "One-touch" DSP filter wide mode allows 'resurfacing' to check the band conditions when operating in narrow mode ■ Dual selectable Beat Cancel (BC) works against intermittent beat interference (except in CW mode) ■ CW auto tune mode links only with the RIT frequency without changing the transmit frequency.

Advance Technology Upgrade is available in new production models and for pre-existing TS-570D/S; contact you dealer for details.

ISO 9001
JQA-1205
Communications Equipment Di
Kenwood Corporation
ISO9001 certification

KENWOOD
Amateur Radio Products Group

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